INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
PROJECT SURVEILLANCE PLAN WORKSHOP An evolutionary change in Government has made performance- based contracting (PBC) a new standard for conducting business. In addition to requiring Government agencies to carefully and explicitly define what they are purchasing, it provides greater freedom to the contractor base to decide how to provide those goods and services. The Project Surveillance Plan (PSP) facilitates Government monitoring of the contractor's performance using a less intrusive method than has been traditionally practiced. This hands-on workshop guides and supports Project Managers in the development of specific Project Surveillance Plans.	Slide #1-1
CLASS PARTICIPANT IDENTIFICATION EXERCISE This exercise provides the instructor a chance to know the class composition as well as their background and motivation for participation. Filling out the cards not only provides the essential information for structuring work groups for the workshops, but also provides the students a better chance to get to know each other. The bonus question provides a key bit of information on the insights of the participants into PBC initiatives and the nature of surveillance in the PBC environment.	Slide #1-2 Note: The instructor is free to introduce this exercise in any appropriate manner. If the training is being provided to a specific project team with a PSP goal in mind, this activity may be dropped. Review of the cards and assignment of teams will be necessary prior to the next day's lessons.

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
COURSE INTRODUCTION This initial block of slides is to be used as a motivational step and an attention-focusing device. Suggested Dialogue: This course will not make a person taller, smarter, or better looking. It will not help one to run faster, or think like Einstein. It will, however, provide the tools needed to develop a Project Surveillance Plan in a team environment. The resulting plan, if executed, can satisfy the general needs of managing a Performance-based Contract. It may or may not save money when compared to doing business in other ways, but it will certainly assure that the Government effectively manages the contract using the methods of insight and limited oversight.	Slide #1-3
WHY PERFORMANCE-BASED CONTRACTING? Due to the continuing pressure on all Government agencies to reduce expenses, funding for NASA is anticipated to drop some $4 billion over the next three fiscal years. Tough decisions concerning individual programs will be required, with some inevitably being canceled or stretched out. With reduced resources, pressure will continue to mount on all NASA groups to assure effective use of resources (i.e., doing the right things to accomplish the Agency mission) and assuring that those endeavors that continue are done as efficiently as possible (i.e., output commensurate with input). Performance-based contracting provides the potential for both efficiency and effectiveness improvements.	Slide #1-4 **Point 1 Reference:** *Federal Computer Week* **article titled "NASA Puts Hold on Space Ops RFP,"** October 7, 1996

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
WHY PERFORMANCE-BASED CONTRACTING? PBC, if executed well, has the distinct possibility of reducing certain types of costs associated with traditional project management. NASA's contractors have flatly declared that they will save approximately $4,000 per day per NASA on-site person in expenses as the oversight staff is reduced. These expenses have been attributed to additional staff requirements (to satisfy NASA reps requirements), to requirements for NASA rep office space and equipment, and to lost productivity time related to normal NASA oversight activities. PBC will remove NASA from many administrative oversight tasks that do not provide value for level of activity. NASA managers believe that they will be able to more effectively focus their staff on its core mission accomplishment. PBC contracts should cost NASA less and reduce internal "overhead" expenses as well.	Slide #1-4 (Concluded)
NASA SUPPORTS PBC NASA senior management has committed itself to improving and essentially changing the way that it does business. The Office of Procurement Policy (OFPP) is an executive branch entity of the Office of Management and Budget (OMB). OMB controls all aspects of the Federal budget process, and OFPP sets all executive branch policy for budget execution. OFPP (and a host of Congressional and citizens groups) have been vocal in making certain that Government obtains good value for the resources that are spent. A key phrase, "pay for performance," has been offered as a key policy initiative in the current administration and is changing the way that many agencies conduct business. In general, citizenry is	Slide #1-5

NASA SUPPORTS PBC

not amenable to continued taxation for programs that they see as being ineffective or inefficient. As a result, executive branch government is focusing on structuring its procurement activities on clearly defining what outcome or product is wanted and rewarding firms financially for efficiently meeting those objectives. NASA was one of the first agencies to formally commit itself to following the policy initiatives of OFPP. (Note: NASA does not embrace a philosophy of doing more with less. It does embrace doing what it does more efficiently and choosing activities that are effective users of resources.)

As a result of NASA's strong embrace of the PBC concept, the Agency is frequently cited within Federal trade journals, management journals, and in frequent press releases as an example of how things can be done right using PBC. Collaborative reinvention approaches assure that NASA will obtain value for its money and tend to make sense within the context of reduced resources.

Slide #1-5 (Concluded)

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
PBC MAKES SENSE Use of PBC makes more sense in a time of constrained resources than other forms of procurement. By establishing performance as the criteria for acceptability of the outcomes of contracted efforts (and for payment), accountability becomes instantly enforceable. When the Government states what it wants for outcomes and describes those outcomes in verifiable terms (and says it will not pay unless those outcomes are met), then the likelihood of achievement is greater. It can be like having a car repaired: most of us would be unlikely to continue to pay a shop for non-effective repairs (i.e., the car problems are not fixed, but shop people were really earnest in trying to find what was wrong). Individuals personally are intolerant of non-performance on a consistent and recurring basis. Many products and services are suitable for use of a PBC approach; some are less so. The choice to use PBC relies on the insights of the procurement officials rather than taking a "one-size-fits-all" approach. The end result of PBC is that it helps to remove NASA from many non-value-adding administrative tasks and allows it to focus on exploring the edges of what is possible. The development of the Project Surveillance Plan is one way to assure that the right things are done to monitor performance attainment without giving up control of essential processes.	Slide #1-6

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UNTITLED Everyone enjoys having the luxury of easing into changes; however, significant changes seldom occur that way. PBC is a change in the way that NASA is choosing to do business. It asks that things be done differently than they have been done in the past. It asks that individually we keep sight of the goals and overall mission and attempt to collaboratively determine the best ways of reaching the goals. PBC *future* is PBC *now*.	**Slide #1-7**
COURSE INTRODUCTION By the completion of this course, the students will have demonstrated in a team-focused environment the necessary skills that will enable them to materially contribute to the creation of a Project Surveillance Plan. Students will obtain this skill base through a combination of lecture, guided discussions, problem analysis, and team solution development. Problems that the student will be required to solve include "best strategy" development, surveillance activity determination, metrics selection, management organization development, and corrective action development. The key to learning is participation in a team that applies its collective knowledge to a common problem.	**Slide #1-8**

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COURSE INTRODUCTION (CONCLUDED) These rules are individualized to the instructor, but are intended to promote an open and critical examination of the surveillance processes required to support PBC contract performance monitoring and assessment. Students will gain more when they discard preconceived notions, stereotyped thinking, and bureaucratic roadblocks to innovative thinking. The analogy of a Christmas tree is applicable. This course provides the framework for decorating the tree, but it is up to the students to determine what the tree will look like at the end of the training.	Slide #1-9
COURSE LEARNING OBJECTIVES This is a ten-lesson course that will provide the student with the basic tools to develop a project-specific Project Surveillance Plan. Although the primary reason that this course is being provided is to prepare the student for completion of a PSP that supports a performance-based contract effort, it is as applicable to a non-PBC effort. The structure that the student will learn can be consistently applied to all forms of project surveillance efforts. The skills employed in articulating a surveillance strategy are crucial to defining the project environment and related enabling approaches to assure that value is obtained from contracted efforts. In developing a suite of performance- monitoring activities and insight-producing metrics, the student will develop critical skills to assess the "value added" nature of each and the capability to select those that provide greatest insight with lowest intrusion into contractor processes. Developing a surveillance organization leads to an appreciation of the coordination required to conduct effective surveillance and the groups that must be involved with the core project team. In addition, the team members will become more aware of the cost of surveillance in the project context.	Slide #1-10

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COURSE OVERVIEW The next three slides illustrate how the course will proceed over the next 15 hours of instruction.	Slide #1-11
COURSE OVERVIEW An interlocking puzzle icon is used to illustrate the Project Surveillance Plan training course. The course begins with a review of PBC concepts and forms to assure that students have a necessary firm foundation. Focus in this section is on explaining the general PBC policy as well as reviewing and contrasting the contact types that can be used in PBC and NASA plans for implementing this approach. The course continues by introducing the Project Surveillance plan by first explaining the OFPP directives for using it and then providing a "strawman" outline and content description for an actual plan. With those foundation elements behind, the course then covers the practical elements and process details of creating the PSP. The first step is to assemble a multidisciplinary development team early in the procurement process to support the development and documentation of a project strategy, surveillance activities and metrics, and surveillance organization. The surveillance plan is in many ways a living document and will undergo changes to reflect the nature of effort. This is all part of the development process and should be anticipated through the plan's life cycle.	Slide #1-12

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COURSE OVERVIEW (CONTINUED)	Slide #1-13

COURSE OVERVIEW (CONTINUED)

The student's learning experience continues as the workshop explores the methods of developing a coherent, self-supporting, outcome-focused strategy for the overall conduct of surveillance. Discussion topics include coordination of multiple, potentially conflicting policies into a coherent statement of approach, the necessity of matching resource means with desired surveillance outcomes, and methods to balance insight approaches with oversight focused procedures. A student seminar will develop a specific set of strategies for the selected exercises.

The course continues with insights on developing surveillance activities that satisfy PBC insight requirements while reducing overall project risk. Specific examples of communications, assurance, and verification activities will be introduced and methods shown to illustrate how they can be used to obtain necessary insight without intrusive oversight. These insights will be put to use by student project teams as they develop a suite of project specific activities that support their surveillance objectives within resource constraints.

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COURSE OVERVIEW (CONCLUDED) The final pieces of this puzzle are added with the development of metrics and organization for project surveillance sections. In the development of metrics, students will be exposed to the concept of metrics measuring project key characteristics of both the process and the product. The development of metrics will be extended to identify the use of metrics, the definition of performance control limits, and management response to non-compliance. The laboratory will allow students to focus on establishing a constrained set of metrics for their project that will allow sufficient insight without imposing onerous reporting procedures. Since this plan will be executed by people, the final sections of the course focus on organizing for surveillance within the context of a project organization. The final workshop allows participants to "scope out" the required surveillance organization that will be required to accomplish the specified activities and monitor successful project performance attainment and product delivery.	**Slide #1-14** **Take a short break after this slide if desired.**
REVIEW OF PBC INITIATIVES This slide introduces the section that outlines the history of PBC in NASA.	**Slide #1-15**

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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
LESSON OVERVIEW This slide introduces the topics to be covered in this lesson. The review of the performance-based contracting initiatives provides the student with the necessary background, insights, techniques, and rationale. It sets the environment for learning about the Project Surveillance Plan and its creation. The lesson reviews current Office of Federal Procurement Policy directives, explains NASA's response, and identifies contact types in general and PBC types specifically. From this basis, the lesson continues to illustrate the linkage between the PBC initiative and the total project-oriented surveillance plan. The lesson concludes with a top-level review of the actual plan itself, defining its purpose and describing the overall structure of the document.	**Slide #1-16** **If the student has not been exposed to the PBC concept or is unfamiliar with the processes of contracting, this lesson may be difficult to absorb all at once.**
REVIEW OF PERFORMANCE-BASED CONTRACTING INITIATIVE This lesson will provide a quick review of the Performance- based Contracting initiative. It will not provide the details of how to write the Statement of Work or how to frame the incentive program. It will introduce the student to the history and the formal and informal requirements that led NASA to the use of PBC as a way of contracting. The lesson provides an overview of contract types that are available and identifies which are most suitable for use in a PBC context. In addition, some possible pairings of work efforts to contract types will be provided. From there, the lesson describes in some detail the requirements of PBC and how it differs from other forms of contracting, particularly in formulating specific requirements and assessing and rewarding specific outcomes. The segment closes with a review of how NASA will bring the PBC approach into the mainstream of project work definition and management and contracting efforts.	**Slide #1-17**

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PBC WITHIN NASA	Slide #1-18

PBC WITHIN NASA

NASA's 1996 Strategic Plan states that NASA has begun the process of changing the way it works with its contractors to achieve Agency objectives. The concept of performance-based contracting provides a mechanism to correct the perceived shortfalls while adapting the Agency to the fiscal realities of sharply constrained resources.

A key tenet of this new policy is that the contractor will be entrusted to meet the Government's requirements with the responsibility and the authority to decide how it will meet the Government's needs. The Government will take a less directive role in describing how goals will be accomplished and will work more as a cooperative, collaborative team member with the industry members to accomplish that goal.

NASA's intent in fielding this policy is to remove Government employees from the business of doing what is now seen as contractor work. It gives the Government more of a hands-off monitoring and insight approach to procuring many of the services and hardware items. In the past, the product frequently was the result of a Government-led team participating directly in its hired contractor force during all stages of the contract performance process. That way of conducting business is to be eliminated, with NASA Project Managers and team members in the future focusing on monitoring for insight.

The implementation of PBC requires a further shift in the way that NASA conducts business by focusing attention on the outputs that achieve objectives rather than the processes of consumption of resources. With the challenge to assure that NASA receives full value of its investment in the products it receives, performance measures will become more important.

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
PBC WITHIN NASA In addition, NASA hopes to create strategic alliances with its contractors in which contractors, through taking prudent risks and pursuing less-than-guaranteed contract opportunities, find it to their overall long-term competitive advantage to pursue business with the Agency. The value added to their commercial offerings comes from using NASA technology and gaining operational experience, value that is potentially greater than just the profits from the immediate contract.	**Slide #1-18 (concluded)**
PBC WITHIN NASA (CONTINUED) 　　　Definitions serve to clarify thinking and often provide a common frame of reference for discussion. Two key definitions of performance-based contracting are provided on this slide. 　　　The OFPP definition provides the sense that performance- based contracting focuses on creating a work-defining statement in which what is wanted is defined rather than how the work is to be performed. Defining the "what" is critical because PBC may be used to contract for services as well as products. 　　　NASA expands this definition to identify the key components of a performance-based contract, namely measurable requirements (which include quality standards) in not only Statements of Work, but also in selecting the contract type, identifying incentives, and executing the contract. 　　　When taken together, PBC is all about contracting with providers using a quantitative basis of defining work efforts, products, and outcomes and then monitoring execution of the contract using quantitative measures of performance to assure that NASA obtains value for its investment.	**Slide #1-19**

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PBC WITHIN NASA (CONCLUDED) In this initiative, NASA has identified four core elements required in the creation of a performance-based contract. Each is critical for the success of the contracted effort, and all are interdependent. The foundation for the contract is the precise definition of the effort. As stated previously, the statement of work must describe the product in terms of an outcome product, state, or condition. Examples might include an interplanetary probe to explore the atmosphere of Pluto, the transfer of 100,000 8"x10" photographs to GIF digital format stored on CD-ROM, or advancement of digital compression schemes employing the wavelet process algorithms. As far as practical, the conditions of the outcome should be quantified or measurable with both minimum acceptable and objective performance thresholds provided for key characteristics. Additionally, an appropriate contract type must be selected. Use of firm fixed price, level of effort, and time and material contracts leaves few options for performance incentives. In this type of contract, the contractor must deliver only the contracted product, labor hours, or materials in the categories specified to obtain remuneration through its invoice to the government. Numerous incentive fee structures support various methods of measuring and subsequently rewarding the contractor for delivered product or service performance. The most frequently used methods provide financial "rewards" for acceptable-or- better performance using a scale previously agreed upon for measurement. The management and operation of the incentive program must strive to be low impact using consensus measures of key characteristic performance. The Project Surveillance Plan describes, which how the Government will execute surveillance of the contracted effort, is analogous to an operations plan. By tailoring activities, metrics, and the surveillance staff to meet the surveillance strategy and contract vehicle, the Project Manager can use the plan to orchestrate the actions of diverse staff elements over the life cycle of the project.	**Slide #1-20**

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PERFORMANCE-BASED CONTRACTING INSIGHTS	**Slide #1-21**

PERFORMANCE-BASED CONTRACTING INSIGHTS

Performance-based contracting within NASA will require new processes to restructure the way the Agency handles acquisition. In the past, acquisition was frequently based on purchasing the time and services of an army of contractors to provide on-call assistance as needed. NASA's intent is to move away from paying and rewarding contractors for merely being present and doing their job. Instead, NASA is looking more towards the promise of performance-based contracting to improve the effectiveness of its investment.

In order for NASA to prosecute this strategy, it must clearly identify the performance of the product that is being purchased as well as emphasize specific, objective, measurable performance elements and specific quality standards by which they the contractor's work will be measured. Both the contractor and NASA will have to agree to these requirements during initial contract negotiations.

PBC REQUIREMENTS

Slide #1-22

This slide identifies elements of PBC that are important in developing a Project Surveillance Plan. The elements of performance-based contracting must be understood by the student so that when they create the Project Surveillance Plan, they will know where they can find the hard requirements and specific performances required by the contract.

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
PBC REQUIREMENTS	Slide #1-22 (concluded)

PBC REQUIREMENTS

The first and most important part of the PBC is the statement of work (SOW). The SOW clearly describes the Government's requirements and defines the system performance requirements in quantitative or qualitative terms. Under PBC, the Government expresses its willingness to accept the contractor solution as long as it meets performance requirements. Unless absolutely necessary, due to safety, legal, or other formal types of requirements, the Government will not tell the contractor how to make the performance happen. For the surveillance plan developer, the statement of work is the primary source of the hard performance requirements and potential thresholds for metric-measured performance. It should be used as an initial position and as a guideline for examining the Project Surveillance Plan, particularly in the metric section. When attempting to measure how well the project is advancing, it is necessary to know the ultimate desired outcome of the project. The SOW shows the goals of the project and what the key requirements are. The developer should determine how these requirements fit into a monitoring program, selectively choosing those areas that require monitoring, measurement, or special activities from the Government's point of view to assure that the statement of work requirements are being met.

Similarly, much of the performance monitoring will be focused on assuring the completion or satisfaction of deliverable items. Deliverable items are routinely specified in a contract data requirements list (DRL) and may include data items from the contractor, hardware items, or perhaps just data. As a project office in NASA develops its Project Surveillance Plan, key activities may include those that provide assurance that progress towards the completion of deliverables is occurring. Metrics should reflect progress against actual items rather than just against schedules of events.

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PBC REQUIREMENTS (CONCLUDED) Two other essential elements of the PBC concept are incentives and the performance evaluation and incentive award process. Performance-based contracting uses incentive structures by which it rewards the contractor for meeting specific goals. Traditionally, incentives have been based on either schedule performance or cost avoidance. The Government will be looking to newer, non-financial means to incentivize the contractor. NASA could offer contractors exclusive rights to emerging technologies, allowing the contractor to retain proprietary rights or hold products that they have developed under contract. Additionally, NASA may consider no rent (no tax) use of Government properties in high-cost areas; transfer of research and development property; no-cost, private use of launch facilities; and other unique incentives to motivate excellent performance. As a matter of practice, elements of the surveillance plan may become a part of the performance evaluation in the incentive award process, depending on the Project Manager. If the Project Manager plans for the surveillance process to include monitoring for incentive award, then the PSP will identify incentive award supporting activities and metrics embedded and woven into the Project Surveillance Plan. Frequent, periodic incentive awards based on completion of well-defined tasks or deliverable items work well within this structure. A task, deliverables, and clear performance goals should be defined early in the project, and performance should be evaluated as soon as possible or at predetermined milestones in the development process. The contractor should be incentivized and rewarded for superior work as it happens.	Slide #1-23

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TYPES OF PBC CONTRACT OPTIONS

Firm fixed price (FFP) and fixed price with economic price adjustments (FP/EPA) are frequently the lowest risk contracts to the Government. The incentive for the contractor is implicitly built-in with the proposed price. The contractor assumes the risk. Generally, if the price of the product or the commodity being sold is stable and if the contractor estimated accurately, enough fee will be built into the cost structure to assure that the contractor does not lose money and, in fact, makes economic return on his money. The Government's risk is normally very low because the contractor is responsible for delivery at a fixed price. The primary risk to the Government is that of non-performance. Should the government push the contractor to accept a margin that is too risky, then the contractor may lose its ability to perform, declare bankruptcy, and cause the contract to be null and void as a result.

Generally, there are no explicit performance incentives on the firm fixed price type of contract. In some cases, the Government offers a provision for economic price adjustment, in which the government agrees to pay a higher cost should external economic factors drive the source materials beyond a certain range. This often requires the contractor to similarly share "excess profits" with the Government should these same factors drop below a certain threshold. If the contractor is able to deliver at a lower cost than was originally projected, then the Government will share in the cost under-run with the contractor.

The most common type of contract that provides for the use of performance-based incentives is in the cost reimbursable area: cost plus incentive fee, cost plus award fee, and cost plus fixed fee. Those products are generally reserved for times when there is uncertainty about the product or the process used to create the product. The contractor assumes technical risk by entering into a contract, and the Government is willing to share in the risk

Slide #1-24

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TYPES OF PBC CONTRACT OPTIONS to some degree by allowing the contractor to recoup reasonable costs incurred in delivering the product the Government wants. The Government incurs increased risk over fixed price contracts, and the contractor reduces his risk substantially. The Government assures that it will at least pay for the reasonable costs of creating and delivering the product. The contractor's profit is then computed using a pre-specified award fee or incentive fee structure, based on the performance in delivering the product. An easy (but not necessarily effective) way to evaluate performance for this type of contract is to compare projected costs versus actual costs. Award fee scales based on resource consumption will incentivize for under-run and in some cases penalize (against base profit) for imprudent over-run. Sometimes, the award fee will include multi-factor types of evaluations. Some types require the Government to appraise the work performance, management, schedule, and cost of performance of the contractor while administering and delivering the product. This process tends to be expensive to administer and frequently has drawbacks related to time delay between performance and reward. The use of a share-line type of incentive for the CPAF contact is gaining wider support. This method requires establishing objective cost, program schedule, and product performance schedules prior to start of work. An accurate means of measuring accomplishment of objectives and well-defined SOW criteria are imperative for this share-line process to work. The cost plus fixed fee contract is beneficial to the contractor. It guarantees a set fee for whatever hours are delivered. There is no negotiation, and the contractor has a set fee schedule. All the contractor must do is deliver the product or services that the Government requests.	Slide #1-24 (continued)

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TYPES OF PBC CONTRACT OPTIONS (CONCLUDED) Indefinite delivery contracts, time and material (T&M) contracts, and labor hour contracts are all generally non-incentive-based programs. The contractor figures into its offer the amount of fee or profit it will receive for delivering a certain product. Particularly in the indefinite quantity, indefinite delivery type of contract, the contractor incurs a considerable amount of risk because these contracts do not require the Government to buy more than just a nominal, very minimal amount of the product on contract. This type of contract is frequently found in the purchase of general commodities such as fuels, office supplies, and computer equipment. The Government in effect states to the contractor, "You will be a source when we need to buy these things; we will guarantee that we will buy at least this much, but there is no guarantee beyond that." The fact that incentives are not generally encountered in this type of contract does not mean that they could not be implemented. Good performance, exceptional service support, and timely delivery can be incentivized if the Government establishes a spot-award incentive pool. Each item purchased could have a small set-aside amount (2 to 4 percent) that when pooled could provide a source of incentive award. By completion of a customer satisfaction card, the purchaser would directly determine how much of this pool was awarded to the contractor. Time and material and labor hour contracts currently do not offer an opportunity for incentives. Depending on the nature of the service being provided, T&M and labor contracts may range from "temp" day labor to the traditional full-time contractor "marching army." Labor services are provided at fixed rate and predetermined fee allowance. Material purchases in T&M are directly supportive of the Government function but require the contractor to comply with Government purchasing rules. Like the indefinite quantity contract, the T&M and labor hour contracts could be incentivized using a similar set-aside pool and frequent award by the direct user of the product based on performance.	Slide #1-25

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OPPORTUNITIES FOR PERFORMANCE BASED CONTRACT IMPLEMENTATION This diagram illustrates those contracted work areas in which NASA could routinely employ performance-based contracting. Routine services include items such as facility operation and maintenance, transportation, and security services. A breakout of non-routine products and services that seem compatible with the PBC approach is shown on the right side of the diagram. Development activities include actions such as the design and creation of new spacecraft and satellites. Technical research delves into applied science related to aeronautics, high-performance computing, and advanced propulsion routine. Pure science efforts generally include areas such as life sciences, material sciences, and mathematical research. Operations and specialty services relate to the continuing contractor operation of NASA Facilities (GOCO), support to technical programs such as Systems Engineering and Configuration Management, and direct specialty engineering and technical analysis support to program offices. With time and experience, the use of the PBC approach will assure that NASA obtains its requirements in a non-intrusive, performance-monitoring manner.	Slide #1-26
PLANS FOR PBC IMPLEMENTATION NASA has begun to establish an environment in which the contractor delivers the product, good, or service and NASA provides insight monitoring to assure that the product being delivered is what was ordered. The shift is made manifest in the Project Surveillance Plan and implemented in the surveillance program. One of the first surveillance plans to employ this approach is the ongoing Tracking and Data Relay Satellite (TDRS) effort in which NASA has awarded a firm fixed price completion contract. Hughes has agreed to warrantee the product's performance on station and during the launch phase. The required surveillance on this program is comparatively minimal, focusing on the insight mechanisms of limited metrics and focused activities.	Slide #1-27 Recommend another short break after this slide.

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PLANS FOR PBC IMPLEMENTATION	Slide #1-27 (continued)

PLANS FOR PBC IMPLEMENTATION

Since the fall of 1995, NASA has been undergoing an Agency-wide PBC awareness and training program in which traveling teams from headquarters have visited each of the centers and provided education and training in PBC concepts. By using model PBC programs such as TDRS and the upcoming Millennia projects, NASA is building an experience base for future efforts. By using an evolutionary process in which an experience base is built initially, bugs are worked out and PBC gradually becomes a way of doing business within core business sectors. *Not all contracts can be performed with performance-based contracting or with an incentivization program.* Tailoring of the project-specific approach falls heavily on the shoulders of the Project Manager.

Other factors may cause the PBC initiative to be put into place more rapidly than currently anticipated. By necessity of sharply constrained budgets, NASA may move toward performance- based contracting across the board in many of its new programs. Due to dramatic staff cutbacks, NASA may simply not have the people available to perform traditional oversight types of functions on some work. They will be forced to trust the contractors to perform what they have been asked to do. NASA will have to develop innovative surveillance methods and embed them in the Project Surveillance Plans. Changes in current surveillance strategies will be needed to allow NASA employees to monitor the project and its progress and to control any sense of unease about its performance.

NASA is clearly beginning to move into new ways of doing business. Particularly exciting is the Advanced Quality Systems initiative in which innovative ways of development, teaming, and long-term partnerships with industry are being brought forward for consideration. These new ideas coming

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PLANS FOR PBC IMPLEMENTATION out of industry describe the means to be successful in this "lean and mean" environment, how to obtain continuously effective performance, and how to incentivize efficiently. Industry is currently working to develop a common set of metrics for project management and systems engineering for aerospace firms. These metrics should be available within the next year and possibly implemented into some of the ISO standards for quality engineering or quality processes. Overall, NASA is moving along smartly and is preparing to implement PBC as a way of doing business.	Slide #1-27 (concluded)
PROJECT SURVEILLANCE PLAN INTRODUCTION This segment will examine the explicit linkage of the PSP to PBC initiatives, the applicable directive guidance, and the purpose of the plan in project management. The introduction will also show the PSP development process in the PBC timeline and introduce the basic structure for a Project Surveillance Plan.	Slide #1-28 and 1-29

PROJECT SURVEILLANCE PLAN BACKGROUND

Slide #1-30

The Project Surveillance Plan is directly linked to the performance-based contracting concept and is an essential part of its successful prosecution. Even though NASA's current base of incentive-based contracts is limited, the requirement to use performance-based contracts in the future indicates that program-specific "insight" surveillance plans will become the norm rather than the exception. Objective criteria embedded in the contract statement of work indicate that contract performance will be required to be measured in novel ways. Criteria will be developed for evaluation of work performance and the quality of products NASA receives. The Project Surveillance Plan becomes an implementing instruction for performance assurance monitoring of the contractor's efforts. The plan describes the project and the processes that will be used. The plan is itself not the project, but rather it is the identification of methods from which the Project Manager can communicate to all people involved in the project how they will conduct business and what is expected to be accomplished in terms of this business. It is a way of communicating the PM's intent to all of those involved in the project.

The OFPP policy letter 91-2 on quality assurance (with NASA as a prime signator) addresses these performance standards and surveillance plans. It states that NASA will use these processes and products whether there is a formal requirement or not. NASA has stated that it will create both performance standards and a surveillance plan to monitor the attainments of those specific project standards.

Simply, the Project Surveillance Plan is required by directive guidance. It makes good sense to use a plan like this to run surveillance on any major program. It provides project continuity and creates the means to communicate project intent clearly to all involved.

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RESULTS FROM SHIFT IN PERFORMANCE SURVEILLANCE PHILOSOPHY This project surveillance approach is the result of the convergence of multiple initiatives that emphasize reduction of Government presence in contracted efforts, that hold organizations and individuals accountable for their performance, and that attempt to "re-invent" or "re-engineer" Government as a means of reducing cost. One key tenet being emphasized in the PBC effort contends that it is possible to monitor the execution of contractor efforts using an insight method of performance monitoring to track the achievement of contracted objectives. This approach is in diametric opposition to previous approaches that dictated continuous involvement of Government workers in contractor processes to assure necessary levels of performance quality. In this new strategic approach, through the careful selection and non-intrusive surveillance of project activities, surveillance objectives can be met and costs to both the Government and contractor reduced. Understanding the difference between these two definitions will be important in the development of the surveillance plan.	Slide #1-31
PURPOSE OF THE PROJECT SURVEILLANCE PLAN The purpose of the PSP is to create a unified strategy for the program to execute project surveillance and to communicate it to all parties involved in the program. That strategy may have different components and may include concepts such as risk mitigation, use of metrics, use of teams, time-phased scope, use of control limits, and organizational relations and responsibilities. It will describe very explicitly the Project Manager's overall strategy to execute a surveillance program. The plan identifies activities, specifies metrics, and identifies the resources needed to conduct this	Slide #1-32

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PURPOSE OF THE PROJECT SURVEILLANCE PLAN surveillance program. It is important to the success of the program because it formalizes commitments among the signatories to follow this process, to commit to the use of resources, and to accomplish what is stated in the plan. The plan is a statement of intent. It is dynamic, living, and changeable as the needs of the project change. Because it does lay out an organization and describe the processes, it should also assign responsibilities to the surveillance team. One of the major findings of the Advanced Quality Systems initiative is the importance of teaming. Almost all successful major industry innovations in the past decade, particularly in the automobile industry and the aerospace industry, have been a result of this team concept.	**Slide #1-32 (concluded)**
TIMELINE FOR BUILDING THE PSP The life cycle of the surveillance plan corresponds closely to that of the contract vehicle. Its life begins shortly after initiation of the development of requirements and concurrently with the development of a contracting strategy. Since the plan reflects how the Project Manager will manage the execution of the project, everyone involved must be a part of the decision-making that affects what will be done. Surveillance activities and metrics needed for insight must be developed from a best informed position because these actions cost real money and require real coordination to happen. The PSP will integrate the incentive processes with continuous performance measurement products as the contracting approach is refined and the contract is let. The building of the plan is incremental, integrated with the contract life cycle, and coherent with the project life cycle. To attempt to develop it in isolation is to invite substantial problems in project monitoring execution.	**Slide #1-33**

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PLAN DEVELOPMENT CYCLE

Slide #1-34

If the plan is assembled properly, the group will have an effective program to execute it. It will set the tone and timbre, it will set the strategy, and it will give the people monitoring the effort the necessary guidance to execute. Project management must assure that everyone reads the plan early on and that managers spend time teaching their staffs initially and recurrently.

When developing the plan, if possible, previous lessons-learned should be consulted. Lessons-learned in like programs, both successful and unsuccessful, are excellent sources of information that can also help team members avoid the pitfalls and pratfalls of previous projects. Lessons-learned are particularly instructive in identifying critical issues that should be identified initially. If these lessons-learned are not written up and readily available, previous Project Managers or staff should be consulted to discover what experiences they have; a wealth of good information can be gleaned from these sources.

The process is important. The process for improvement is a continuum of ensuring the right results are obtained from the right information. If the team starts feeling uncomfortable about the process, then efforts should be expended to make it comfortable. It can be a matter of streamlining or improving communication. Sometimes the group may need more assurance of progress and institute a targeted verification effort or conduct a limited procedure or process audit. The intent in the process of improvement is to provide assurance that activities are happening in the desired way according to the contractual agreement. Those activities will frequently build up the good feelings, or the bad feelings, that the project is either on track or not on track.

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
PLAN DEVELOPMENT CYCLE As success is met in executing the surveillance plan, make sure these successes are shared with others across the Agency. News of great successes, using the well-designed and easy-to-execute plans developed by a superbly trained team, should be shared with others. Problems as well successes should be shared. As the core of experience expands, avoid using a "cookie cutter" plan. Researching new ideas, developing them, and sharing them take time and are worthwhile activities. Other projects may be able to adapt some of these ideas for their needs.	**Slide #1-34 (concluded)**
PSP CONTENT OVERVIEW The surveillance plan structure is very much like other plans already seen. It includes an introduction, a discussion of the background, and then an introduction to the specifics of the project. The introduction provides basic background discussion material for traceability to overall project objectives. It allows those executing the project to clearly understand its genesis and the overall NASA approach to executing this contract. The surveillance program objective identifies the purpose of surveillance in this project. This sets the stage for developing a strategy and a technical approach to executing the strategy. The plan articulates the surveillance strategy, describes the specific activities and approaches to be employed, and ties those items to the overall project schedule. The plan also identifies specific metrics that will be used in the project and specifies in a constructive manner how they will be used in surveillance and project management. Identification of metrics will be covered later and tends to be a somewhat contentious issue. Current NASA policy requires use of a core set of project metrics focused on societal goals, budget tracking, and milestone schedules, but not at all on project accomplishment. Later discussion will explore using pareto analysis to focus attention on identifying, resolving, and tracking known problem areas with easy-to-grasp metrics. Selecting proactive metrics will also be discussed.	**Slide #1-35**

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SUMMARY
 	
    No longer can project management be executed with each supporting discipline conducting business in isolation from the other. The PBC initiative makes this clear: requirements must be unambiguous, concise, and focused on defined outcomes. The contracting vehicle and accompanying project management/Project Surveillance Plan must provide a means for the Agency to assure it will obtain value for the investment of public funds. When good performance is encountered (as determined by objective standards and observed repeatable outcomes), it must be incentivized in a positive and immediate manner. PBC provides the framework for moving NASA into the forefront of compliance with executive actions to streamline Government and restore public confidence in Government's ability to operate in a financially responsible manner.
 	
    The use of the PSP within PBC to drive internal processes in this way is one of many initiatives aimed at improving contracting practices. It is probably the most integrative and the most available in the short term to achieve needed efficiencies in manpower and contractor outputs. Use of a standard approach will help to codify a new way of thinking and operating in the upcoming time of austerity. Without this type of approach, NASA may have significant difficulty in meeting legislative and executive branch mandates for improving the way it conducts business. By learning how to develop the PSP in the coming sessions, the student has the potential to become a driving force in revamping the way NASA does business and to play a role in defining the future rather than waiting for it to happen to them.
	Slide #1-36

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PROJECT SURVEILLANCE PLAN PURPOSE AND STRUCTURE	Slide #2-1
This lesson continues to build on the previous lesson that introduced the Performance-based Contracting initiative and provided the background information concerning the Project Manager's reasons for having a Project Surveillance Plan (PSP). The PSP is an essential tool for effective management of performance-based contracts for both goods and services and facilitates NASA transition to operations using performance contracts.	
In this lesson, the class members will explore the recommended structure for a PSP, including the contents and rationale for each section. The resulting plan provides the Project Manager and staff with a comprehensive instruction for conducting total project surveillance.	
OVERVIEW	Slide #2-2
This slide provides an overview of the topics covered in this lesson.	<u>Note:</u> Instructor should make certain that all students received an individual copy of the sample PSP.
In addition to the student handouts for this lesson, each student should have a copy of the sample Project Surveillance Plan available. It will be used to illustrate some of the concepts introduced in the lesson and to provide an opportunity for discussion.	

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PURPOSE OF THE PROJECT SURVEILLANCE PLAN

The Project Surveillance Plan is the single instrument that explains how the Project Manager will execute his charter to conduct insight-based performance surveillance of contractor activities. Without this plan, project surveillance efforts are likely to be unfocused, non-complementary, and somewhat ineffective in achieving project goals. Here are the specific outcomes that can be expected from creating the plan.

- The Project Manager's intent for surveillance will be articulated in terms of an overarching strategy and may be used as a guideline to all members of the project team. It provides a "big picture" view of project priorities and the way that the Project Manager intends to achieve them. It shows how the Government will gain and maintain confidence in the contractor's products and processes and unambiguously identifies the measures to be employed in assessing the contractor's performance in meeting project key characteristics.

- The plan focuses activities to the select few needed to provide contractual and management confidence in product quality and process integrity. Other surveillance activities not within the identified scope will not be allowed. If any activity fails to add value to the project, it will be considered for exclusion.

- The PSP provides the necessary level of instructional and directive detail to execute surveillance. Specific identification of metrics, surveillance activities, and management response to contractor non-conforming performance, coupled with obligation of needed resources, provides a powerful tool to manage programs under the PBC initiative.

Slide #2-3

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
PSP CONTENT OVERVIEW This slide displays a representative table of contents of a PBC Project Surveillance Plan. At a distance, some of the sections, particularly when taken in isolation from each other, may seem superfluous. However, when taken in toto, they provide for a comprehensive expression of the entire surveillance program. Use of all elements of this structure provides the opportunity to fabricate a superior PSP and execute a well-integrated surveillance program. This lesson will continue by explaining the contents of each section using both slides and the IO3 Project Surveillance Plan as an example. This entirely fabricated project surveillance plan provides insights into the types of information and scope of inputs that might be appropriate for inclusion in specific plans. Some sections will be covered in more detail than others in this lesson. The sections not covered in as much detail here (Strategy, Activities, Metrics, and Organization) will be covered in separate lessons with both lecture and laboratory exercises.	Slide #2-4 <u>Note</u>: The instructor should have a copy of the IO3 PSP available to hold up for the students to see. You may also want to entertain the option of asking the class to identify additional PSP table of contents items. If you do, be prepared to enter them under the major sections shown here (requires Vis-a-vis markers or slide annotation software)
INTRODUCTION The "Introduction" section summarizes the project at a high level, yet provides considerable information regarding specific performance objectives for both the product and the producing contractor. The introduction casts much of the background information in terms that a casual reader can read and readily grasp. However, the process of summarization requires a deep and comprehensive understanding of the entire project, its objectives, the required performances, and the related contracting elements. The "Introduction" section should have two subsections: background and project introduction.	Slide #2-5 <u>Note</u>: Open to the IO3 project plan to illustrate these concepts. This PSP has a detailed review of the contract vehicle, incentive structure, and prior experience, but does not use the key characteristics table. Similarly, the schedule is included in an appendix to the plan.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
• **Background** - **By providing a summary of prior background of the effort, the casual reader can readily grasp where the agency has been with respect to the surveillance project. If the current effort is a continuation of an ongoing effort or is similar to other projects, taking the time to identify issues, problems, and success strategies related to them is instructive and worth the effort when framing the surveillance plan. When framing this section, it is a good time to make a quick visit to the "lessons learned" and "best practices" data bases to discover previous "noble failures" and success stories and to contact individually the key workers to gain insights.** • **Project Introduction** - **This section should provide, at a minimum, references to the project source documents. If possible, inclusion of a single table of core, key characteristics and threshold performance requirements is well worth the effort and will be exceedingly useful when establishing metrics and setting control limits. Additionally, creating a summary of the contract type and salient features provides a traceable justification to develop a specific surveillance strategy. Similarly, illustrating the project top-level schedule events using a simple timeline or Gantt chart provides the team with a better understanding of the dependencies involved with inserting specific surveillance activities. The project introduction should focus on identifying the basis of key characteristic performances rather than any element of performance surveillance.**	**Slide #2-5 (concluded)** **Note: Ask the students to identify other information about the project that would enhance the understanding of a casual reviewer.**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

SURVEILLANCE PROGRAM OBJECTIVES
 	
    The need for setting objectives can be difficult to comprehend for many students because defining the reason for a surveillance program is frequently subsumed by regulatory or directive guidance that simply states that the surveillance program will be. This section is a preamble to the later strategy section. When taken with the project requirements, the surveillance program objectives provide a complete basis for project surveillance activity and metric development.
 	
    When possible, surveillance outcomes and specific project performance outcomes (apart from technical objectives) should be assessed in some detail to determine if achieving these objectives will result in a value-added outcome to the project or the agency. If the objective is simply the result of a constraint, then reconsideration may be in order. Constraint-based objectives are usually easier to articulate in positive attainment-focused terms rather than "shall-not" terms.
	Slide #2-6
	
	<u>Note</u>: In the IO3 PSP, point out the project surveillance program objectives. Ask the students to suggest additional focused objectives.

APPLICABLE NASA DIRECTIVES, POLICIES, AND PROCEDURES The current NASA environment is complicated by the ongoing transition of supporting directives, handbooks, and instructions to less prescriptive documents. As such, the project team will need to identify specifically applicable directives and guidance documentation that may be applicable by public law, directive guidance, or policy letter. Other specific compliance items may have been identified in the requirements/ Statement of Work (SOW), such as inspection processes, test sequences, MIL standards (environmental, shock and vibration, etc.) that have direct bearing on surveillance activities.	Slide #2-7 <u>Note</u>: In practice, this section of the plan can be used constructively by an aggressive manager to reduce the scope of non-value-adding surveillance elements or used to "pad" a program to build a personal empire. Discussions of this topic may be instructive to the students if handled with insight and a positive attitude towards truly changing NASA.

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The direct inclusion of extracted requirements in the Project Surveillance Plan strengthens the document as a comprehensive, "one-stop" source of information. It also provides immediate and direct traceability for any specific activities or required project management metrics that the Project Manager would otherwise consider to be no value-added. Since this plan belongs to the Project Manager and his management team, the surveillance authoring team may be placed in a situation of having to justify portions of their creation (that they might not have included otherwise).	Slide #2-7 (concluded)
SURVEILLANCE STRATEGY AND APPROACH This section serves as the intellectual premise for all other elements of the plan. The development of activities and metrics and the designation of supporting organization responsibilities flow directly from the stated strategy and approach to surveillance. In simple terms, the strategy describes what will be done to conduct surveillance and how the organization will go about doing it. Since considerable time will be spent in a future lesson fully developing these concepts, this slide serves only as a quick preview of the salient elements. Performance-based contracting initiatives have been quite explicit in stating that NASA will be transitioning from LOE-type contracts to completion-based contracts. The difference in level of NASA involvement between contractor oversight and performance-monitoring insight is significant, and the specific strategy is based on a wide range of variables. Some of the more important variables affecting surveillance strategy include maturity of the project technology, experience of the contractor's project team, prior agency experience, and agency project management attitude towards risk taking. The specific strategy approach may range from seeking waivers for all formal monitoring activities to requiring continuous inspection and	Slide #2-8 Note: Use the IO3 PSP to introduce the composite strategy of focused risk reduction, compliance assurance, and project health monitoring. Point out that this strategy is based on a combination of factors such as past experience, contract type and warranty features, and standing NASA project management directives. Ask students to suggest other types of strategies that might be employed for specific contract types.

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audit to assure strict conformance with requirements. The actual plan strategy will probably find a middle ground of confidence-building activities and insight-producing metrics.	**Slide #2-8 (concluded)**

PROJECT SURVEILLANCE ACTIVITIES AND SCHEDULE 　　Surveillance activities are probably the most important element in defining the level of Government oversight over the contractor's effort. The hope of establishing an insight-focused program rests heavily on Government restraint in specifying surveillance activities. Frequently, these activities are called out openly in the Contract Data Requirements List (CDRL), in Data Item Descriptions (DIDs), and in product acceptance criteria found in the SOW or other RFP documentation. Frequently, an additional and extensive set of "mandatory" surveillance activities is hidden in contract-cited MIL-STDs; Memoranda of Agreement/Understanding between NASA and DOD; NASA HQ, Center, or Office procedures; and Project Instructions. Since, considerable time will be spent in a future lesson fully developing project surveillance activities, this slide serves only as a quick preview of the salient elements. 　　Surveillance includes three general types of activities: communications, performance verification, and product assurance. Of these, activities related to performance verification are the least subjective and easiest to define. Communications and assurance activities tend to be "comfort" focused (that is, providing the purchaser a warm feeling that the end product is of the quality specified and on schedule). These subjective activities also tend to be the most emotional because each involves a group of professionals with a vested interest in the continuation of their respective surveillance processes. When compiling the list of surveillance activities, assure that they indeed add value to the final product, or at least provide significant margins of comfort to the contract management process.	**Slide #2-9** **Note:** The IO3 PSP includes two differing types of surveillance activities: true risk reduction (based on risk issues) and project monitoring activities.

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
The integration of surveillance activities into the master schedule serves two purposes: it provides visibility of the surveillance program as a vital element of project management to both the contractor and Government alike, and it requires careful selection of activities such that they do not interrupt the flow of the effort. The non-interrruption feature forces the Government to focus on finding true insight-building, confidence-enhancing activities rather than a standard litany of "always done it that way" activities.	Slide #2-9 (concluded) Note: The traditional scope of design and review are significantly curtailed from traditional NASA and DOD models. What other elements of the surveillance process could be foreshortened to improve efficiency while meeting specific plan objectives?
PROJECT SURVEILLANCE METRICS AND CONTROL LIMITS With the ongoing redistribution of personnel and reduction in staffing levels, contractor performance metrics will be of increased importance in project management. A select set of insight-forming, predictive, proactive data measurements can, when used appropriately, substitute for manpower-intensive oversight activities. The establishment of control limits to describe acceptable performance levels is in keeping with the quality movement and may provide tangible benefits to project management. This metric model should be considered for use by all elements of the program, not just for monitoring contractor performance, but also for monitoring the project office and supporting offices job performance.	Slide #2-10 The IO3 PSP metric table has approximately 12 NASA-directed metrics included as mandatory items. Ideally, the metric data plan would be much smaller, with less emphasis on social goals and other non-product performance data items. Bring out the observation that it is ultimately up to the project manager and staff to actively define, refine, and use the metrics model.

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• Metrics are more than just the data model and the standardization of the data display. To be effective, the metric description should encompass not only the data model, but also the management control model. When taken together, a complete input-analysis-feedback process is defined. • Frequently, performance metrics lack a well-defined tie-in to management response. By explicitly describing management response, the PM organization and contractor know up front, in a contract-like format, what is expected and what is the impact of not meeting expectations.	Slide #2-10 (concluded)
PROJECT SURVEILLANCE ORGANIZATION AND REQUIRED RESOURCES Ultimately, it is the people of this project plan and their joint endeavors that tie it all together. It is possible to craft the most elegant project surveillance plan, but if it is not used, not adequately resourced, or caught up in inter-organizational turf battles, it is probably a greater liability than asset. Three key elements must be found in this section: *who* does *what* and *with which resources*. This one section will require considerable coordination and assured buy-in by all participants. Since considerable time will be spent in a future lesson fully developing project surveillance organization, this slide serves as a quick preview of the section elements.	Slide #2-11 Note: Between 3 and 12% of the total project funding for surveillance activities (and staff) is a reasonble planning horizon. Again, visit the IO3 PSP for a developed example of resources and people.

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One major challenge is to fully involve an accountabilty scheme that makes all contributors to the surveillance process accountable to the Project Manager. The most significant challenge will be to obligate the multi-year financial resources to perform the surveillance job correctly. Full cost-accounting initiatives will pressure PMs to make hard choices for individuals and organizations based on project "best values." The resources identified should have clear traceability to the activities and strategies. In most cases, a project organization top-level WBS and staffing plan will be required to develop the initial support staff estimate.	Slide #2-11 (concluded)
SUMMARY This lesson has introduced the details of the Project Surveillance Plan contents. Some sections have been included to facilitate the development of strategy, activities, and metrics and to provide absolute traceability of the surveillance plan to project key characteristics. Each section relies on what went before as a part of the process of defining the surveillance program. The next module will introduce the process of developing the surveillance plan.	Slide #2-12

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
CREATING THE PROJECT SURVEILLANCE PLAN DEVELOPMENT TEAM This session provides a process for the creation of a Project Surveillance Plan (PSP) development team. The last lesson provided an overview of the content of the PSP. This lesson is a logical continuation that provides the "how-to" for team selection, team building, work processes, and plan coordination.	**Slide #3-1**
LEARNING OBJECTIVES Learning objectives are summarized on this slide. The creation of the Project Surveillance Plan requires a disciplined approach executed by a knowledgeable team of experienced professionals. Since the PSP guides the monitoring of the contractor's performance, the time it takes to integrate it with all elements of the contracting and performance process can pay dividends during the execution phase of the project.	**Slide #3-2**
REVIEW OF PAST LESSON - PSP PURPOSE Recall the following basics. The Project Surveillance Plan is the *single* instrument that explains how the Project Manager will execute the charter to conduct insight-based performance surveillance of contractor activities. • It provides a "big picture" view of project priorities and how the Project Manager intends to achieve them. It shows how the Government will gain and maintain confidence in the contractor's products and processes and unambiguously identifies the measures to be employed in assessing the contractor's performance in controlling project key characteristics.	**Slide #3-3**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
REVIEW OF PAST LESSON - PSP PURPOSE • It focuses activities down to the select few needed to provide contractual and management confidence in product quality and process integrity. • It provides the necessary level of instructional and directive detail to execute surveillance. Specifically identifying metrics, surveillance activities, and management response to contractor non-conforming performance, coupled with obligating needed resources, provides a powerful tool for managing programs under the PBC initiative. The next slide reviews the structure that the team will use to craft the Project Surveillance Plan.	**Slide #3-3 (concluded)**
REVIEW OF PAST LESSON - PSP CONTENT OVERVIEW The plan structure reflects a top-down, logical flow-down of surveillance strategy from project performance objectives and NASA program initiatives. Activities, metrics, team composition, and resource allocation reflect the surveillance strategy within the constraints of project priorities, funding profiles, and available staff. The entire plan is balanced to achieve NASA's objectives in a "best-of-class" business-like manner while demonstrating careful stewardship of resources.	**Slide #3-4**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
BUILDING THE PROJECT SURVEILLANCE PLAN This slide introduces the major topics to be covered during this lesson. The next three slides concerning "Guidelines" provide the general philosophy to guide a team while introducing operational realities that the team will face. In the two "PSP Development Cycles" slides, the need to synchronize the creation of the plan with other project activities is discussed. There is a great opportunity for inter-team synergy and cross fertilization of ideas during the SOW/ Requirements-generation phase of the project. Careful coordination and planned concurrency of scheduled activities provides opportunities for process improvement. However, the team must be provided firm guidance on a defined delivery date in order to provide a plan from which work can begin. The plan should be a flexible tool to meet the evolving needs of the program and be changeable during the project's life span. When something in the plan does not work, then it should be changed to something that does. The four slides on "The PSP Team" discuss selection of people as a core issue in establishing the PSP. People with a vested interest in the project and the process are essential. Ideally, the PSP development team should include key persons that will actually execute the project. When the project is ready to execute, they will not suffer from the problems of interpretation or understanding during start up. They will know why a surveillance strategy was selected and are the best advocates for the process, activity, or metric identified to implement that strategy.	**Slide #3-5**

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BUILDING THE PROJECT SURVEILLANCE PLAN The key processes of the team, discussed in the slides concerning "Processes of the Authoring Team," include not just putting ideas on paper. The team must demonstrate creativity by introducing innovative methods of surveillance, planning surveillance to meet goals within resource constraints, setting realistic expectations for management (and other outside authorities) on what will and will not be accomplished, and most importantly, completing staff coordination of the plan.	**Slide #3-5 (concluded)**
GUIDELINES FOR CREATING THE PSP The following guidelines provide a philosophy to guide the project team and Project Manager in developing the plan. • **People are the heart of the process. They define the requirements, create the product, deliver the service, and work the program. The PSP project team is unique because they imagine a process and capture it in a plan that tells the world how they intend to conduct the surveillance. This surveillance process must assure to the agency that the contractor will deliver the items or services specified by the contract.** • **The PSP authoring team must be multi-faceted and incorporate the views and interests of key NASA functional areas. Significant efficiency benefits have been demonstrated in the use of multi-functional project teams by the aerospace and automobile industries (a benefit that NASA should capture). In the most effective organizations, the functional team is assembled for the life of the project. It is drawn from a functional pool, with allegiance to the project rather than a functional bureaucracy. These experts must know how things are done within their functional area, but must be willing to "work the system" for the benefit of their project.**	**Slide #3-6**

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GUIDELINES FOR CREATING THE PSP (CONTINUED) • **The team members must know from the very beginning who leads the team. Although the team is collaborative in nature, the project manager (PM) is ultimately in charge. He or she has a responsibility to the team to articulate the vision, to define what is to be done, and to determine what constitutes success. Before the team begins forming strategy and flowing down activities and metrics into a plan, an initial planning session with the PM establishes the ground rules.** • **Part of the initial planning and rule-setting meeting includes the collaborative creation of a schedule and the dedication of resources to the PSP team. The PM is a gatekeeper to upper-echelon management, providing both protection and access as the situation dictates. Team members can be expected to complete lateral coordination, keeping the PM informed of issues that may result in programmatic problems. Additionally, the PM may have insights into sensitivities that may render areas or ideas politically off limits and must communicate them to the team.**	**Slide #3-7**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
GUIDELINES FOR CREATING THE PSP (CONCLUDED) • The theories presented during the next day and a half will undoubtedly be tempered by practical experience of the team. However, the team must police itself, continuously asking the following questions: Does it add value? What exactly is the value? Is the benefit worth the cost? Too often, individuals and organizations fail to ask these questions and become involved in processes and activities that detract from accomplishing the real job. • The PSP development ream must realize that negotiation is a part of the coordination process and must be equipped to deal with this reality. Small changes in stating requirements or referencing standards may result in significant differences in how surveillance must be conducted and the related expenses of conducting it. Frequently, the PSP team will be well apprised of current surveillance processes and will know what works and what does not; thus, they should work with the SOW team to prevent them from repeating past mistakes. • The team must be aware of "pet rocks" of influential approval-granters and accommodate them as well as possible. Whenever possible, they should subtly turn sometimes low-value activities and metrics into high-value composite/combined items. When needed, the team must be ready to consult with the PM on critical "make or break" points. The team may want to consider some added activities or metrics of marginal value as a "throwaway," compromise that can be tailored collaboratively to create a desired end state.	Slide #3-8

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

PSP DEVELOPMENT CYCLE
 	
     Timing is critical. The initial draft surveillance plan and statement of work should be written at the same time. As the basic program strategy is formed and a method is identified to prosecute this overall effort, surveillance of both mission-assurance related outcomes as well as PBC requirements should be built in to the SOW. The PSP development team identifies surveillance as a key project management activity and allocates resources to assure it will be accomplished. It should force opportunities for frequent intense crossfeed of information while building the surveillance plan. The team members include elements that they know will need surveillance support, such as design engineering. Early in the development process, the PSP takes on the flavor of an integrated project ensuring surveillance is included in the project from the very beginning.
 	
     The project team should be finalizing the first release of the surveillance plan at the time of contract award and final negotiations with the contractor, but again this is always open for revision and change. The plan should be flexible enough to meet the needs of the Project Manager. The plan should preserve an option to drop back or to change the way that the project will be managed and executed. The plan should also include flexible response as part of the surveillance plan strategy and identify how to change in the event that the program fails to materialize in the way anticipated.
	Slide #3-9

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
PSP DEVELOPMENT CYCLE (CONCLUDED) A property assembled plan will lead to an effectively executed project. It will set the tone and timbre, it will set the strategy, and it will give the people monitoring the effort the necessary guidance for execution. The PM, as part of the surveillance team, must assure that these monitors read it early on and must spend the time to teach them initially and on an ongoing basis. When developing the plan, the PSP team should take time to find lessons learned. Lessons learned in like programs, both successful and unsuccessful, are excellent sources of information and can also help the team members avoid the pitfalls and pratfalls of those that have been there before them. Lessons learned are particularly instructive in identifying critical issues that should be known as an initial position. If the PSP development team members cannot find these lessons learned written up and neatly filed, they should spend time with previous Project Managers or staff to discover what experiences they have. A wealth of valuable information can be gleaned from these sources.	**Slide #3-10**
PURPOSE OF THE TEAM The PSP team plans the execution phase of the project under the concept of PBC. Since the contractor is entrusted and empowered to plan and conduct the effort, the role of the agency is to assure that the right product is being delivered. The role of oversight requires the careful articulation of a strategy, selection of activities, and a full description of performance metrics and corresponding control limits. It requires the implementation of good business practices by a self-starting, proactive team of professionals with sufficient resources to execute their tasked assignments.	**Slide #3-11**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
PURPOSE OF THE TEAM Experience in performance-based contracts within DOD shows that it is exceedingly expensive to all parties to allow "muddy" or unclear requirements, processes, or procedures related to key characteristics to remain unresolved until Government approval actions. The team that creates the PSP can help to avoid this sort of problem by surfacing issues early in the project life, by coordinating with those that determine project performance requirements, and by seeking clarification or correction prior to final contract award. The team must be "true believers" in the PBC-PSP process and must be willing to lead others to see the logic of their plan, particularly when their plan does not include an inefficient but time-honored tradition or "always-done-it-that-way" practice. The team itself should be self-governing, using activities, metrics, and processes similar to those it promotes to allow management to gain experience in insight-based surveillance.	Slide #3-11 (concluded)
THE PSP TEAM: ORGANIZATION Although collaborative in nature, the team must be task organized with the goal of completing a comprehensive, Project Surveillance Plan in the time period allowed. Recommended Team members are identified on this slide. The team leader provides technical direction and guidance and is the lead "outside man" to represent the team with project management and other functional areas. The team leader sets schedules, follows up on the completion of individually accepted responsibilities, and generally sets the team tempo and direction.	Slide #3-12

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THE PSP TEAM: ORGANIZATION	**Slide #3-12 (concluded)**
The group facilitator serves to guide group work sessions and maintain direction in discussion sessions. The facilitator works directly for the team leader or designated topic leader, following the session agenda and assuring that meeting objectives are met, that group rules are adhered to, and that results and assignments are recorded for the record. Recent experiences in Government and private circles have demonstrated that skilled meeting facilitators can enhance group productivity by providing a necessary management tool to the meeting process.	
The "book boss" assumes the responsibility of coordinating team inputs, editing the content, and making the document read with the voice of one author. The "book boss" works closely with the project manager and the administrative support staff to create and coordinate publication and distribution schedules, to execute document configuration control, and to receive and consolidate reviewer comments and suggestions.	
The primary team members are responsible to the team leader and each other to produce an integrated Project Surveillance Plan that they will commit to using to conduct project surveillance. The multidisciplinary nature of the team provides the opportunity for a truly collaborative effort, considering the needs of each functional project management discipline while maintaining a project focus on technical performance and total program success. Depending on the nature of the project, the number of personnel from each area and the exact mixture of skills may vary dramatically. It is essential that team members have the authority to speak for their functional discipline and commit to a community course of action without obtaining outside approval. However, team members may still want to consult with their peers when a novel concept is proposed, if for no other reason to obtain insights into the technical feasibility of the concept.	

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THE PSP TEAM: SKILLS REQUIRED

The team integrates the collaborative skills and abilities of the team members to achieve a specific goal: the creation of a Project Surveillance Plan. By bringing individual experience, insight, and creativity together for a joint effort, synergy may be achieved, resulting in a plan that meets the needs of multiple functions while assuring necessary contractor insight.

If possible, the team should include members with prior experience in executing a performance-based contract, participating in quality action or process improvement teams, defining performance requirements or key characteristics, and writing technical documents. The combination of group skills and technical expertise, when infused with the attitude of making a difference and being in control of one's own destiny, often results in significant breakthrough thinking and achievement.

Slide #3-13

<u>Note</u>: Instructor may wish to solicit NASA team success stories or recount the Ford Taurus/Dodge Stratus Team stories. (Horror stories can also be used but are less instructive - they focus on what not to do without providing a positive model.) Focus on using the board for recording contributing success behaviors and team organization/operations strategies.

THE PSP TEAM: SUPPORT REQUIRED FOR TEAM OPERATIONS

Team members require a defined, separable workspace with sufficient resources to accomplish their task. Team members seem to work well in a "war room" setting, complete with large retrievable drawing areas to brainstorm, explain, or explore concepts, ideas, and linkages. To sustain the excitement of creating something significant, new, and different and to keep the pressure on to complete the job, physical separation of team members from the routine of their daily work environment can be helpful.

Slide #3-14

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
THE PSP TEAM: SUPPORT REQUIRED FOR TEAM OPERATIONS The team will also require the technical tools needed to access information, create new information, and edit existing information. Basic computer applications with a modern computer and printer aid these processes. Similarly, ready access to the internet, NASA intranet, fax machines, wide area telephone service, and voice messaging tools provide the ability to remain "plugged in" and able to obtain needed information from on-line or personal sources. The most critical resource in forming the PSP is background information. As identified in the previous lesson, an extensive summary of critical project documentation is required as a mandatory first step in creating the plan. Every person on the team must be well steeped in this mass of background material (and in particular, performance requirements/contract SOW) and use it to bring a general understanding of overall project objectives, performance requirements, and proposed contractor efforts. In addition, individuals should take additional time to fully comprehend all items directly affecting their areas of expertise. Area experts should be ready to negotiate changes to any consensus position that runs counter to methods of performance-based contracting or regularly places NASA in an "in-line" approval role in contractor work processes. Quality process information and Government/industry-generated "best practice" data bases can often serve as a catalyst that encourages team members to imagine the possible and create innovative monitoring activities and metrics.	Slide #3-14 (concluded)

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
PROCESSES OF THE PSP AUTHORING TEAM Team processes are driven in part by the team leader and his vision for the possible. As a team with multiple, specific, task-oriented goals, the PSP authoring team seeks to craft an integrated Project Surveillance Plan. In doing this, the team must consider the realm of the financially possible, create a surveillance strategy and action plan, and present it in manner that allows rapid coordination and realistic project expectations for the outcome of surveillance operations.	**Slide #3-15** Note: Other team-related processes include team consensus creation, internal project planning, objective setting, interpersonal communication, and work completion.
INTRODUCING INNOVATION AND SETTING REALISTIC EXPECTATIONS The team process relies on individuals bringing both classic and new ideas to the table to achieve a balanced mix of activities and performance-measuring metrics that allow insight monitoring of the contractor's progress. Innovation is easiest to introduce during change points, such as project start-up, reorganization of project management, change in contractor or contractor management, milestone review, or phase transition. The team should examine not only the external processes (what they do in conjunction with the monitored contractor), but also the internal processes used by the agency to maintain insight and effective control over the entire surveillance process. As proposed earlier, if what is being done does not bring value to the project, the agency, or the agency's clients, then it should be considered for possible elimination.	**Slide #3-16** Additional Resources: *Mining Group Gold* by Tom Kayser (23 minute video and instructor guide) – Proven process used to achieve more creativity, efficiency, and higher quality decisions from groups *Designing Cross-functional Business Processes* by Bernard Johnson (text) – Toolset for integrated business process design

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
INTRODUCING INNOVATION AND SETTING REALISTIC EXPECTATIONS Introducing innovation for innovation's sake adds to the "bells and whistles" value, but may result in noise rather than real value. Sources of proven new ideas may include industry "best practices" data bases, industry technical journals, technical symposia and conferences, commercially available training, and management magazines. If possible, the team should look deeper than the latest trend to find the root problem that the innovation addresses. Technology by itself is but one tool that permits new processes to be implemented, and most frequently, employed to enhance the speed or accuracy of communication. In establishing innovative processes, the team may by its very enthusiasm generate hopes and expectations that truly exceed realistic possibilities. In particular, the expectation that an agency-contractor team will suddenly achieve breakthrough levels of productivity or efficiency due to the implementation of PBC and a new incentive program is not based in common experience. The team must plan for measured introduction of innovative methods with a learning-curve-like response of surveillance effectiveness to these methods. Although the total numbers of Government personnel required to execute insight performance monitoring will very likely be fewer than oversight monitoring, the initial effectiveness of this reduced cadre may be initially depressed below expectations. As the cadre learns, effectiveness in their work should increase.	**Slide #3-16 (concluded)**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

COMPLETING PLAN COORDINATION FOR APPROVAL
 	
    The plan is not complete until approved. The team is essential to the process of ensuring the plan is approved. This slide identifies what are considered to be prudent steps required to ensure the plan is approved.
 	
    • Depending on the contract and agency/center rules, the plan could be approved anywhere from the Project Manager to the Center Director.
    • Various coordination strategies may be employed by the team, including shotgun, concentric circles, and linear models. The basic concept is to obtain buy-in for plan execution from those who will be tasked to perform. The first layer is co-workers and the internal project organization, those with the greatest interest in the plan. If the plan clears this review, other directly tasked groups will be asked for a commitment in their review.
	Slide #3-17

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COMPLETING PLAN COORDINATION FOR APPROVAL If time is particularly short, use of a focused coordination conference can streamline approval. Each coordination group member is provided a copy of the proposed plan, asked for review and comment, and invited to attend a coordination conference. If comments are provided early, they can be assembled for use in the coordination conference. Respondents assemble for a conference and make necessary changes to the proposed plan, publish the changes, and sign off for their functional group. This process, although sometimes unwieldy due to the number of respondents, results in nearly immediate results without the bureaucratic paper drag. During coordination, configuration control of the plan will be critical, particularly when electronic means are used. Actions taken to mark up the original must preserve the integrity of the original unchanged plan. Although placing this responsibility on the "book boss" often works, he or she will need cooperation and assistance for successful configuration control.	**Slide #3-17 (concluded)**
SUMMARY There is no simple, 12-step process to create the Project Surveillance Plan. Its creation involves assembling the best people, providing them with the tools and time to do the job, clarifying issues as they arise, and checking on their progress as the plan becomes a reality. The plan belongs to the project. The people of the project can make it a reality and make it their own. The authoring team is in a unique position to script their future and should be encouraged to take ownership of their product. Time spent in crafting this plan can provide substantial benefits in the execution of the project.	**Slide #3-18**

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PREPARATION FOR NEXT LESSON The assignment for the next lesson is to become familiar with the products necessary for developing a project surveillance strategy, identifying activities, and specifying metrics. Time spent in understanding the background will be worthwhile when crafting surveillance plans.	**Slide #3-20** <u>Note</u>: Assure students have copies of all documents listed on the slide.

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ESTABLISHING THE SURVEILLANCE STRATEGY	Slide #4-1

ESTABLISHING THE SURVEILLANCE STRATEGY

This slide introduces Lesson 4 of the Project Surveillance Plan Workshop.

Robert Miller and Stephen Heiman in their book *Successful Large Account Management* observe: "At every level of the organization, the people supposedly in charge of the account *aren't*. Having no established system for managing account information, they muddle, ticking off monthly quotas and hoping for the best, while their accounts drift out of control."

They continue:

"The seat of the pants approach to account management is extremely common in modern business. For an idea of how effective it is, listen to some definitions of the word "muddle." Associating it with the noun "mud," our Oxford Dictionary gives us the following: "to mismanage;" "to render unintelligible by lack of method;" "to busy oneself aimlessly." Most pointed of all for our purposes: " to waste time or money without clearly knowing how."

Substituting the word "project" for "account produces a rather grim assessment of most project management in any activity. The intent of this module and the subsequent laboratory is to teach the group how to develop a coherent strategy for project surveillance. Subsequent modules will provide insights to identify activities and metrics to support this strategy.

This one module provides the essential foundation for creating an effective plan. Using a question-based approach, the team can come to understand their environment, the project objectives, and the conditions of conducting business in which NASA is no longer the overseer of contractor performance. By carefully articulating an interlocking set of project *strategies*, a congruent set of activities and insight-forming metrics based on these strategies can be identified for use in project surveillance and execution management.

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
ESTABLISHING THE SURVEILLANCE STRATEGY Without the foundational element of strategy, the Project Manager and supporting team can at best hope to muddle through using "tried and true," "cookbook" methods to monitor contractor product-production performance, but with sharply reduced resources to execute the job. At best, they can only hope that the contractor's problems are not too significant and that the risks of non-success are low as they attempt to attain the required outcomes.	**Slide #4-1 (concluded)**
INTRODUCTION Strategy is the basic philosophy used in accomplishing anything. It is a frequently used term, even more frequently abused, and covers the waterfront of business events all the way from defining a specific technical approach to problem solving (problem solving strategy - simulation modeling) to defining conditions of military employment in pursuit of vital national objectives (National Military Strategy). However, its coherent articulation and wide understanding are vital to the execution of whatever is being done. As seen here, strategy provides the common ground that everyone in the organization can understand and the basis from which to execute surveillance and monitoring of the project. Activities make the strategy real. It is one thing to claim that the project will conduct only insight-based surveillance, but if one of the surveillance activities mandates NASA inspector in-line 100 percent monitoring of PC board solder joint quality, it has not adequately defined insight surveillance. This is a basic premise in leadership: you must walk the talk. It is just as applicable here. Strategy must be internally coherent, and activities must be coherent with strategy. Together, surveillance strategy and surveillance activities form the project management foundation.	**Slide #4-2**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
LEARNING OBJECTIVE Upon completing this lesson, the students, assuming a strong background in their respective disciplines and general management experience, will be able to identify appropriate strategies for the execution of project surveillance. The student will be able to identify risk areas based on contract type, contractor and agency prior experience, funding profiles, and outcome expectations. Based on conditions of task complexity and contractor/agency experience, the student will be able to select sound approaches to task management. This knowledge is absolutely required to successfully complete the subsequent activity and strategy development module.	Slide #4-3
REVIEW OF PAST LESSON The prior lesson explored the process required to build the PSP. It emphasized the necessity of using a team of dedicated individuals to create the PSP. Others certainly share this philosophy. "We can't tell you which members of your organization should or shouldn't be on any given account management team (*project management team*). But we can tell you, with certainty born of long experience, that the most effective Account (*project*) strategies are created, synergistically, by small groups - groups where *every* member is committed to the account's long term success." Robert Miller and Stephen Heiman in *Successful Large Account Management* We reviewed the team responsibilities in detail and provided a framework for organizing to perform work. Each team will have the opportunity to put these practices into action as the class creates program strategy, identifies surveillance activities and metrics, and establishes a surveillance organization.	Slide #4-4

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
OVERVIEW The lesson presented in this session deals with an essential topic: creating the surveillance strategy. After defining the terms of reference and setting a framework for defining specific elements of strategy, the lesson will examine factors that must be considered in selecting a specific project strategy. Complete understanding of the framework is essential because strategy has not only the long-term focus, but also a mid-term (operational) and immediate (tactical) component to it. Each must be complementary and consistent for effective surveillance.	Slide #4-5

DEFINITION OF A STRATEGY
 	
    The word strategy is so pervasive in modern culture that almost any plan will be called a strategy and either protected as a secret or bandied about as the cure-all for all ills. In very general terms, a *strategy describes how things will be done to reach any set of objectives.* Strategy implies thinking and planning at the very highest levels.
 	
    Strategy is not exquisitely detailed planning that describes every planned element. It is a statement of the general themes of action in terms that reflect the "how" of the surveillance operations. It is a process that requires decision making to define at the very highest level how enterprise operations will be done.   Key insights to be gathered from these definitions include a requirement for the following: identified objectives; some form of operations (efforts) that are used to apply resources to accomplish the objectives; available resources; and a form of organization that directs the procedural or quantitative way that tasks will be accomplished. Strategy itself demonstrated in areas such as defense or energy policy, operational plans of action in multi-year budgets, and precepts of how business is enacted through everyday operations.
	Slide #4-6

SURVEILLANCE STRATEGY Surveillance strategy is a specific application of the concept of strategy that requires the identification of objectives (what is expected to be achieved), the policy for achieving (how surveillance will be conducted), the pairing of resources and actions (putting money to the task), and identification of the methods to be used to achieve the objectives of project surveillance.	Slide #4-7

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
FACTORS TO CONSIDER	Slide #4-8

FACTORS TO CONSIDER

Creation of the surveillance strategy requires consideration of multiple factors Strategy requires a decision-making process to describe how tasks will be accomplished to reach a set of objectives. One apparent difficulty in framing the strategy is that every decision must weigh between multiple objectives and constraints, some apparent, some more subtle, and some unspoken. The apparent areas include project objectives, contractor past performance, resource availability, and project risk reduction. The more subtle objectives may include adequate distribution of resourcing among various interests, preservation or amalgamation of perceived power, and other socio-economic goals.

Some items, such as formal contractual requirements, simply cannot be excluded. If a Firm Fixed Price contract is awarded, but the surveillance approach desired by the PM was not part of contract, it cannot be used. If it is used, it will create a potentially higher cost to the Government. For example, if using Government process audits as a means of providing greater assurance was not planned for, additional cost may be incurred. The subtleties of continuing performance many affect the strategy decisions as the contract progresses. Frequently, if performance has met or exceeded expectations, or an exceptional trust relationship emerges (or the converse), surveillance strategy may need to change.

In addition, the strategy framers must make value judgments and trade-offs concerning the relative importance of each of these objectives for both the short and long term. A short-term accomplishment may destroy the possibility of future resource streams. Balancing competing interests among powerful factions is always difficult, not without personal or personality flavor, and sometimes hazardous to one's career.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
FACTORS TO CONSIDER (CONCLUDED)	Slide #4-8 (concluded)

FACTORS TO CONSIDER (CONCLUDED)

Insight-Producing Story:

In response to hard times and a shortage of dog food, a shepherd was forced to evaluate the need to maintain a large pack of dogs to run his operation. The shepherd reviewed multiple options, ranging from killing sheep to feed the dogs to laying off several dogs, but wanted to maintain an effective pack. He finally hit on the ideal strategy: he would cut off one hind leg of each dog. No dog would be required to be laid off, and with the decreased muscle mass, each dog could now get by on less food. Needless to say, the leg-removal strategy met with limited acceptance within the user (dog) community; however, management perceptions were that the procedure reduced overhead (three legs are cheaper to feed than four) and resulted in a meaner (certainly) and leaner (maybe) organization. The truth was that the organization was severely crippled by the move, lost a considerable amount of confidence in management, and felt hobbled by their inability to flexibly roam their territory. However, some were more than overjoyed by their new ease of marking their territory. A pack of three-legged dogs was definitely distinctive in the marketplace, but their ability to perform the necessary routine shepherding tasks was severely curtailed. As a result, the sheep owners withdrew their accounts of managed sheep from the shepherd, and eventually, the entire shepherding enterprise went into receivership and the pack of dogs eventually let go.

This story is told only as a caution. The shepherd employed sound analytical techniques, employed the latest management fads, and truly respected his work force. The dogs certainly were used to the good judgment of the shepherd and reluctantly followed his leadership. However, the strategy was essentially flawed at its core because the solution failed to add value to the task at hand. When choosing strategies, the approach should clearly add value to existing practices.

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STRATEGY - CONSISTENT WITH POLICY Project strategies naturally flow from the enterprise environment, reflecting the corporate wisdom of the best way to reach corporate objectives. When appropriate, "breakout" project strategies may be employed, signaling significant changes in the enterprise business model or acting as an experiment to test alternatives to conventional wisdom. NASA policy in contracting is beginning to reflect Federal initiatives that stress accountability for results of resource commitments. The Performance-based Contracting initiative builds on long-standing policies of establishing product requirements and directing the contract efforts to assure that the contractor delivers the desired product. The reduction of NASA resources and general aerospace industry pressure to reduce Government-unique process specifications, inspection requirements, and documentation overhead are resulting in policies mandating use of "insight" producing activities rather than intrusive oversight practices. Inclusion of quality-enhancing practices into NASA projects is being championed by the Advanced Quality Systems initiative as a means of leapfrogging to improved levels of productivity. The recently mandated use of ISO 9000 is designed to enhance supplier and prime contractor product quality and to improve initial product yield in manufacturing processes.	**Slide #4-9**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS

TOP LEVEL - DEFINE ENDS

Slide #4-10

Top-level strategies are based on general expectations for surveillance, multiple biases and experiences of the project team, and corporate wisdom on the best way to execute projects. One effective way of establishing strategies free of bias is to articulate the general objectives of surveillance. By defining the desired end, the PSP team can easily determine if their strategies actually tie back into a desired outcome. When strategies, activities, or metrics do not tie back, then they are suspect from the perspective of outcome-based surveillance. The first step of surveillance strategy formation is defining the desired ends of project surveillance.

Several sample objectives are shown here as an illustration, but are generally valid for any project. Additional objectives might include assuring contractor compliance with Federal contracting, environmental, and workplace regulations and directives; promoting workplace diversity; obtaining high levels of local community involvement; or achieving exemplary levels of performance needed for the Baldridge Quality Award. Surveillance in itself cannot guarantee achievement of any of the desired ends. Achievement of ends generally comes from offering a qualified bidder a fair price for delivery of a well-defined product or service. Requests for exceptional service or quality should generally be compensated according to the level of service required. Common business practice indicates that attempts to pay less than the going rate for a product or service result in the risk of not receiving the desired product and having to buy it from another, hopefully qualified vendor. Is it not more prudent to plan on paying the going price and reducing overall risk of non-performance?

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
MID LEVEL - DEFINE MEANS	Slide #4-11

MID LEVEL - DEFINE MEANS

After describing what surveillance is supposed to do for the project, the next step is determining the approach to be taken to achieve those objectives. This critical step must consider the interplay of a wide range of variables that will be considered later. The outcome of the team's analysis will be statements regarding the surveillance approaches to be used in the project.

Surveillance approaches include such as the following:

- Oversight implies in-line, direct NASA involvement in contractor processes.

- Assurance relies on process and plan integrity as a means of assuring output suitability and quality.

- Verification relies on inspections and sampling. (Good plans rely on both assurance and verification.)

- Communications can be formal or informal; written, electronic, or verbal; pre-planned or as needed; hierarchical or peer oriented.

- Resource use makes the determination of how much will be spent on performance surveillance and who will be responsible to do it.

- Issue resolution and risk analysis are popular techniques to identify problem areas and focus attention on "fixing" them to reduce overall project risk.

These mid-level strategies serve to focus the development of activities, metrics, and organization to ways that support the overall surveillance approach.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
BASE LEVEL - DEFINE STYLE The base level of strategy defines the style of surveillance in terms of interpersonal approaches. Consider the difference in the styles of management of a drill sergeant and his young troops as opposed to a dean and a group of college professors. The drill sergeant is directive, authoritarian, immediately involved in the processes of the troops, and not necessarily open to discussion. The dean is usually collaborative, consensus seeking, aware of but not involved directly in his faculty's work, and usually very open to discussion. These are examples of the stylistic elements of strategy that the team will define in its plan. Key points to consider when defining the surveillance style are the task and the means available for execution. Elements of each are shown here for consideration and discussion. (Later slides will help to show the interplay of these elements when defining the style of surveillance.) The base-level strategy describes the intensity of roles (involvement, directiveness, oversight, leadership, etc.) that NASA will play in the "means" strategy approaches.	Slide #4-12
EXAMPLES OF SURVEILLANCE STRATEGIES This slide introduces some representative surveillance strategies. This level of strategy describes a general statement of the instruments of influence or action that will be used to achieve the objectives. These strategies must be balanced by time, task, and environment. The complete policy strategy may include several congruent policy strategies balanced in a way that prescribes the relative contribution of each to achieving the project surveillance and completion objectives. The **contractor oversight** strategy envisions direct supervision of task performance and in-line involvement in contracted efforts by an external group. Continuous inspection, review, approval, participation, and in some cases, concurrent work performance of the assigned task are performed by the overseer with varying levels of contractor autonomy to conduct work independently.	Slide #4-13

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
EXAMPLES OF SURVEILLANCE STRATEGIES The **insight** strategy envisions indirect monitoring of contractor task performance without in-line involvement in contractor processes or procedures unless called for in negotiated contract documents. This strategy emphasizes continuous monitoring using non-intrusive data collection and analysis and selected assurance activities. It allows a high degree of contractor autonomy in delivering the required product or service.	Slide #4-13 (concluded)
EXAMPLES OF SURVEILLANCE STRATEGIES (CONTINUED) Other surveillance strategies at the policy level are available. The **outcome**-**focused** strategy embodies the belief that attaining the end is justification of the means: the success of the project is supreme over all other considerations. Attainment of project schedules, use of performance charts and statistics, and continuous pressure to meet or exceed "standards" are hallmarks of this strategy. Verification activities are used to confirm outcome attainment. Much of the focus of this method is aimed at "after the fact" activities. An **incentive**-**driven** strategy is designed to enhance the contractor's performance by providing specific financial or competitive incentives to provide high-quality products or maintain a certain level of worker performance. This strategy counts on the appeal of incentives to induce workers to perform in certain manners. As a precaution, the use of this form of strategy requires development of an independent assessment technique and the demonstrated accessibility of the incentive award. The performance assessment technique should be structured to provide rapid reinforcing incentive payments shortly after the outstanding performance is noted and requires coordination mechanisms that allow for rapid funds transfer.	Slide #4-14

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
EXAMPLES OF SURVEILLANCE STRATEGIES (CONTINUED) This slide introduces representative surveillance strategies that reflect the necessity for and means of coordinating resources and activities. This level of strategy describes the specific instruments of influence or action to be used and the general timing and intensity of their use and provides for the coordination of all instruments to achieve desired effects. A **procedure compliance** strategy reflects the belief that if everything is performed with rigorous adherence to written procedure, the outcome will certainly be right. Activities and resources are committed to assuring and verifying that product development, production, and execution are performed according to procedure. A shortfall of this strategy sometimes surfaces when the procedures themselves are in error, subject to interpretation, or incomplete.	Slide #4-15
EXAMPLES OF SURVEILLANCE STRATEGIES (CONTINUED) An **issue**-**resolution**-**focused** strategy relies on the identification of "show-stopping" items or processes that will certainly prevent the completion of the project should they fail to materialize or operate correctly. Issues can be frequently discerned from prior experiences or known technical problems. This strategy allows for focusing specific resources on resolving issues before they move into critical focus and threaten to stop project progress.	Slide #4-16

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EXAMPLES OF SURVEILLANCE STRATEGIES (CONTINUED) A **risk reduction** strategy is a form of issue-focused strategy in which a technical assessment of the identified issues is used to prioritize surveillance and project management activities. Issues are often rated on probability of outcome and severity of impact should the outcome occur. The joint rating of these two factors is used to prioritize resolution activities. Resource allocation decisions are focused on activities that develop mitigation factors to reduce the likelihood of occurrence and/or isolate the system from the impact if the unfavorable outcome does occur.	**Slide #4-17**
EXAMPLES OF SURVEILLANCE STRATEGIES (CONTINUED) A **centralized plan** strategy relies on a strong central planning organization to determine and direct execution of project execution and performance surveillance. Frequently, resource allocation will be made using a benefit optimization or risk minimization allocation algorithm. To achieve the expected level of performance, strict compliance with the execution plan is required. A basic underlying premise in this strategy is that the central control function is the natural place to execute the project.	**Slide #4-18**
EXAMPLES OF SURVEILLANCE EXECUTION STRATEGIES (CONTINUED) Use of the **minimal surveillance** execution strategy provides almost exclusive attention to verification of end item performance because of the nature of the tasked effort and the contractor team undertaking the effort. In the performance of the effort, the project staff monitors only the few minor issues and assures contract compliance, providing at most "well contractor" checks. This approach is particularly appropriate in low-risk, low-cost purchases from a proven contractor with good demonstrated performance in prior similar efforts.	**Slide #4-19**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
EXAMPLES OF SURVEILLANCE STRATEGIES (CONTINUED) A **management by exception** surveillance execution strategy attends to the routine maintenance of administrative requirements and reserves intense management attention for items that become critical in nature. The general management by exception approach assumes that the organization under surveillance generally knows how to perform the tasks at hand with a certain level of competency. Some liken this approach to "fire fighting," in which attention is directed primarily to fighting the nearest blaze. In reality, there always seems to be a fire to put out and managers using this method are frequently seen as reactive rather than proactive. It is possible to modify a pure fire-fighting approach to one that is more proactive if the manager uses an upper-level strategy such as risk management, by which he or she is provided continuing updates on fire status. By concentrating energies on the truly urgent issues rather than just the immediate issues, a better balance of efforts can be maintained, without entering a purely reactive mode of operations.	Slide #4-20
EXAMPLES OF SURVEILLANCE STRATEGIES (CONTINUED) The **close surveillance** execution strategy attempts to monitor almost all project areas simultaneously with a high level of scrutiny and oversight. In this approach, nearly all approval actions are funneled through a central decision-maker for review and subsequent approval with day-to-day activities and project status closely monitored in real time. Additionally, the scope of oversight may be quite extensive in this execution strategy. Generally, due to the scope of involvement and individual and organizational history with close surveillance, independent initiative leading to process improvements is seldom realized. The difficulty of operating in this mode is that it requires more persons than are usually available, and without a focused approach to sort critical items from non-critical items, the overall surveillance program degrades to chaos and disorganization with the nearest target being the one shot at.	Slide #4-21

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
EXAMPLES OF SURVEILLANCE STRATEGIES (CONCLUDED) The **pre-emptory monitoring** execution strategy is the idealized business school approach in which management uses well-developed measures to predict upcoming critical conditions or events. Based on this insight, the manager can take anticipatory corrective actions to preclude the event or correct the situation before it reaches critical status. This model is the basis of NASA insight-monitoring directions in the PBC initiative. A key aspect of this strategy is the selection of the "right" set of leading indicators, which may be either objective or subjective in nature and represent essential processes or outputs. This strategy of execution tends to work quite well when the underlying process is stable, when environments change within narrow limits of expectation, and when organizational dynamics are limited. However, in conditions of unstable environments, uncertain organizational relationships, and new production lines, this method can only report that a crisis (or startup or reorganization) is underway.	Slide #4-22
SPECIAL CASE: ISSUE-DRIVEN STRATEGY The issue-driven strategy is a particularly effective means of matching resources to surveillance tasks (coordinating resources and activities). This strategy is based on employing "insider" knowledge of past problems and problem areas to identify management "watch" areas for additional discretionary surveillance attention. Issues critical to project success become a part of the management team focus and are monitored for trends. This strategy, if prosecuted conscientiously, can provide a balanced view of the potential problems facing the project team (and the contractor) in its management of the contract effort. In some cases, the shortfall or issue is amenable to resolution by specific one-time or short-term activities, thus allowing it to be "worked off" the issue list. The issue list provides everyone on the project team a comprehensive statement of "what is important" and allows the focusing of lower level strategy (activities identification and organizational tasking) towards resolving the problem areas.	Slide #4-23

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SPECIAL CASE: ISSUE-DRIVEN STRATEGY There are some disadvantages to the use of this strategy. The project management team, by focusing on the "issues," may lose its sensitivity to unanticipated or emerging problems, resulting in surprise and confusion when an "unknown - unknown" (Johari Window terminology for a not previously imagined - not previously revealed event/trait) occurs. If the method of issue prioritization is biased significantly, then the project team may find itself working off "issues" or focusing on resolving "problems" that already perform quite effectively. Finally, this strategy requires a significant up front investment from management to honestly identify issues. In some cases, teams focus on identifying symptoms rather than root cause issues because it is often easier to control the display of symptoms than resolve the root cause. However, in contrast to the normal "muddling around," this strategy provides a means to direct surveillance action in meaningful ways.	**Slide #4-23 (concluded)**
SPECIAL CASE: ISSUE-DRIVEN STRATEGY (CONCLUDED) Using the issue-driven strategy requires discipline and the ability to put aside individual differences based on functional parochialism. Given the measurable project objectives captured in the performance-based contract and the top-level PBC policy that states we "pay for results not best efforts," the PSP team will need to make hard decisions on which goals are truly important. An observation from life is that some things are simply more important than others. Although many objectives have legal precedent, they may not qualify as issues despite the personal bias of the team or external pressure to include them. A good question to use in deciding if the item is an issue is as follows: *If we didn't successfully complete this, would the success of the mission be significantly subject to compromise?* If the issue clears this hurdle, then it is up to the team to provide some form of prioritization of issues to assist the project team in managing the contracted effort.	**Slide #4-24** **Note:** Take a short break after this slide.

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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
SPECIAL CASE: ISSUE-DRIVEN STRATEGY (CONCLUDED) This list of prioritization methods provides some methods that can be used to determine relative importance. Risk-ranking methods tend to serve well to assure that issues with high probability of occurrence and most significant level of impact are accorded the higher levels of attention. The other methods also provide additional insights and prevent everything from being "critical." The prime point here is that somehow, among all the issues, the more important ones must rise to an appropriate level of continuing surveillance by project managers.	**Slide #4-24**
METHODS FOR SELECTING STRATEGIES This chart borrows from the Blake-Mouton Management Grid approach to leadership in which the authors defined a range of leadership styles based on task requirements and organization interpersonal orientation. Their approach differentiated the x axis as "concern for production" and the y axis as "concern for people." On their model, movement to the right on the x axis and vertically up on the y axis represented increases in the respective concerns. For the purposes of this lesson, a different measure of the axes has been used to reach a similar differentiation of the applicable management styles required to reach objectives.	**Slide #4-25**

METHODS FOR SELECTING STRATEGIES

In this model, the y axis represents contractor attributes related to management team maturity and prior organizational experience (and success) in completing similar or related contracted efforts. The x axis represents attributes of the work being contracted out, specifically the complexity, scope, scale, and expense of the effort. Again, complexity or maturity increases with movement to the right or up. Upon examination of this matrix of possible combinations, the four quadrants stand out in their contrasts.

The upper-right quadrant represents a highly experienced contractor working a complex, high-cost task. The Government role of task management can easily fall to that of "coach," providing non-directive guidance based on focused scrutiny of selected individuals and overall team coordination with the objective of maintaining high levels of team performance. The government does not actually execute the effort, but makes certain that the organization responsible for production has as few impediments as possible to performance while assuring the product meets performance requirements. The coach, however, retains the final authority on strategic decisions and is responsible to the "owners" for product quality and quantity.

The lower-right quadrant represents a more directive style, perhaps reminiscent of a drill sergeant. The contractor lacks the experience needed to execute on its own, yet the complexity/importance of the task still remains high. This quadrant requires a great deal of oversight and procedural regimentation to achieve objectives. The model of a participative leader, working directly with the "recruits" and showing by example and repetition how things must be accomplished, fits this quadrant quite well. The leader remains intensely involved in the day-to-day activities until the maturity of the contractor progresses to the point that a more "coach-like" approach can be taken.

Slide #4-25 (continued)

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The upper-left quadrant reflects the skilled contractor executing a low-complexity or well understood project. In this quadrant, the Government role can be much more relaxed, trusting that should problems occur, the contractor can resolve most of them or need only minimal intervention by the Government to reach a solution. This sector of the model is the ideal situation for both the contractor and the Government when executing a performance-based contract, requiring the least amount of intervention by the Government due to low risk and nearly assured performance. Caution: This sector is sometimes subject to "bait and switch" in which the contractor proposes experience in his proposal but actually uses the task as a means of acquiring experience for less experienced staff. In many cases, this is not a problem because of the availability of experience within the firm; however, use of good leading metrics can alert the project staff to a potential emerging situation.

The lower-left quadrant reflects a low-complexity task being conducted by an inexperienced group. Use of an approach that is rife with strict procedural controls and a directive management style tends to assure normative success. Frequently seen as the "ash and trash" work, this quadrant can be used as a growing process for teaching new leaders a more participative means of leading, with embedded processes for improving the overall efficiency of work procedures in the work program. This one area usually has opportunity for substantial improvement because of the traditional disdain. Government participation in model programs in this quadrant is frequently a good investment that results in across-the-board improvements at all similar activities.

Slide #4-25 (continued)

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
METHODS FOR SELECTING STRATEGIES The central position (moderate experience, moderate complexity) is modeled as the mentor. The Government can provide opportunities for the contractor to employ more progressive techniques or processes while executing increasingly more complex tasks. Introduction of practices such as benchmarking, statistical process control, and feedback monitoring lead the contractor to refine his acceptable processes to become better in management style and more able to compete for other contracted efforts. Mentoring is like coaching but tends to be more directive in guiding organizations in selecting a specific path to conduct efforts.	**Slide #4-25 (concluded)**
METHODS FOR SELECTING STRATEGIES (CONCLUDED) This cube is intended to help select appropriate strategies for performance monitoring. This diagram uses the concept of color intensity as a means of helping to assess the level of intensity of roles that the work effort monitor (Government) must be prepared to take to successfully manage the effort to completion. The dark blue end of the spectrum indicates intense involvement, and the light blue end low levels of involvement. Three dimensions (task complexity and risk, contractor experience and capability, and contract type) are shown because they predominate the assessment process. Here are some rules of thumb: **Contract type predominates over all**. When the Government has directed an FFP contract for a given good or service, the SOW describes what is to be done, and the DRL/CDRL describes the end result and delivery conditions. On the other hand, in an LOE effort, the Government must continually assign work to the supporting contractor, supervise the results, and provide training or supervision as the work is performed. The contracted help technically has no authority to make independent decisions in the method of completion of the work.	**Slide #4-26**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
METHODS FOR SELECTING STRATEGIES (CONCLUDED)	Slide #4-26 (continued)

METHODS FOR SELECTING STRATEGIES (CONCLUDED)

Task Complexity/Risk describes the work to be done and considers the outcome if elements of the task are not necessarily completed to standard. Tasks with a high level of complexity/risk should be considered for closer attention than those of a routine nature.

Contractor Experience/Capability describes the competence of the selected contractor in the assigned work area. Less experienced teams will require a higher level of attention than those with extensive experience. **Caution:** A long time incumbent may have forgotten some of the basics and become stale in actual execution competence. Look for "crispness" of execution, competence in decision making, lack of bureaucracy, and lean teams with experienced people to be an indicator of "goodness" in this measure.

Probable Scenarios

High Complexity Task - Experienced Contractor - Cost plus Incentive Contract - Complex or risky tasks can be completed competently by a skilled contractor, but the Government will always be prudent to continue to obtain information to assure solid insight into the program. Combinations of good grass-roots communications and critical process metrics are among the best to use. (Because the best contractors make it look easy, you can be assured that the top-level metrics will always look good, and the results of assurance activities will be by the letter. To effectively monitor this situation, look for ways to really get inside the operation and take the pulse of critical processes.)

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
METHODS FOR SELECTING STRATEGIES (CONCLUDED)

Low Complexity/Risk Task - Inexperienced Contractor - Cost plus Incentive Contract - Basic services contracts often result in this combination as a part of small/disadvantaged business advocacy. As a project, avoid the temptation to "fall asleep at the wheel." Contractors will need solid coaching in development of methods to internally manage their efforts, to develop meaningful metrics, to establish a control process, and to stabilize processes. Some direction of the management team may be necessary, but stress the need for the contractor management team training and basic skills development for the workforce. These activities pay off by reducing contractor employee turnover, increasing the management skills of the contractor team, improving the quality of product or service being delivered, improving contractor incentive fee payments, and providing the Government project team with the appropriate information needed to monitor progress.

High Complexity/Risk Task - Experienced Contractor - LOE Contract - This is a typical collaborative Government lab and big aerospace prime contractor type effort. The most difficult part of this effort is containing continuous changes that drive engineering and development costs. The accounting systems and metrics systems are seldom a problem. Experienced program managers can control these once a baseline is established. However, better ideas can sabotage a project that is simply seeking a proof of concept. Keep the good ideas on the drawing board for the next iteration, if the concept proves out. Government-contractor relations are collegial; - the Government can learn a great deal about managing R&D projects (particularly cost control) from the contractor by observing their processes for managing expectations and technology infusion. | Slide #4-26 (concluded) |

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
SUMMARY This lesson has focused on identifying types of activities to support project surveillance strategy. When identifying candidate surveillance activities for inclusion in the PSP, the team should pass the item through a two-stage filter. First stage asks if the activity brings value to the contractor's product (or if not doing it directly takes away value) and then determines if the activity provides insight into critical contractor processes and outcomes. Tailoring the activities and strategy to the life cycle of the project and contract is critical. Early stages may require a greater level of process and procedure oversight until the agency obtains the needed level of assurance that the contractor seems to be a well-run business entity capable of delivering the services and goods requested and that the resulting product or service meets agency needs. Once those predefined hurdles are cleared, then adjustments in strategy and surveillance activities can be made to adjust to a greater reliance on insight-based performance-monitoring activities.	Slide #4-27
INSTRUCTIONS FOR LEADING A FACILITATED STRATEGY FORMATION SESSION This instruction provides techniques for facilitating a large working group session in the process of identifying a project surveillance strategy for a Project Surveillance Plan. This step has no slides or other visual aids. Required resources include large writing surfaces, large free-standing easel, pad and markers, and Student Worksheets from PSP Module 4. Students must have completed modules 1 through 4 of the PBC PSP training course. In addition., they must also have an understanding and appreciation of technical issues, program management issues, contracting approach, and basic performance requirements of either the student problem or their specific project. The instructor should begin with a brief review of the essential linkage between surveillance objectives (ends) and surveillance means. The instructor will also reiterate the use of the model that links task complexity and contractor skills to define level of needed Government involvement in the task. Using	

INSTRUCTIONS FOR LEADING A FACILITATED STRATEGY FORMATION SESSION (CONTINUED)

the Background worksheet as a guide , review the history of the project, the projected contracting approach, project staff experience, and the technical and management issues facing the team. With that completed, identify areas of project risk. When assessing risk, consider first the probability of adverse outcome/situation and the impact if the adverse outcome occurred. If the assessment shows a high probability of adverse outcome and high probability of occurrence, then the item is a high-risk area. These areas will require direct attention when crafting the strategy.

Using the un-numbered Strategy Formation Worksheet, lead a discussion to identify the key policy directives that influence this project: PBC, ISO 9000, Single Block Initiative, Insight Monitoring, etc. With this basis established, lead the class to identify the specific outcomes that they expect surveillance to accomplish. Items may include outcomes such as contract completion with specified level of output or outcome, control of environmental damage, cost control, safe workplace, high level of customer satisfaction, verified product performance, enhanced NASA public image, and technology transfer. This is the key exercise in building the surveillance plan. All further identification of activities, metrics, organization functions, and elements of strategy are directed towards achieving these ends. *Caution is indicated* . Surveillance cannot assure that the contractor will perform successfully; all it can do is keep management sufficiently aware of performance so that corrective or proactive actions can be taken. Be careful not to identify outcomes that surveillance will not directly affect. If possible, transcribe this list neatly to a large sheet of paper and fix it on a wall for continuing reference.

Next, conduct a task complexity, contractor maturity, contract type analysis to determine an appropriate level of NASA involvement (oversight versus insight). If necessary, differentiate major task areas within the contract.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
INSTRUCTIONS FOR LEADING A FACILITATED STRATEGY FORMATION SESSION (CONCLUDED) With all of this information, identify the means that the project team will use to meet the surveillance objectives by major task area (or for the entire task). Examples may be direct communications; assurance activities (reviews, audits, inspections, etc.); verification activities (sampling, test and evaluation, acceptance inspection, etc.); metrics collection, analysis, and review; and constructive contractor feedback. Adjectives modifying the relative degree of use of the various tools are appropriate to show the focus. Be certain to address any expected changes to the relative level of use of any tools during the contract life cycle. Using Strategy Formation Worksheet (II), determine if surveillance of the specific issue-resolution or risk-reduction technique outcomes or progress is appropriate. If so, identify the types of surveillance that will be used and their relative amounts. Finally, craft a strategy statement from the words and intents gathered. Start off with a statement such as "The XXX project staff will conduct performance surveillance of the ZZZ contract(or) using a predominantly insight-focused approach. Our intent by this approach is to achieve (some of the key surveillance outcomes) using a multi-pronged approach of assurance building, performance verification, and metrics monitoring." Then go into the specific details as needed to describe the specific tasks and relative mixes of methods to be used. If possible, weave a justification for the mix or level of Government involvement based on issues, risk, task complexity, or contractor experience into the entire paragraph. Expect this to be a rough draft with significant polishing to be required; however, all information needed to craft the strategy statement has been gathered, sorted, and categorized and is ready for further use.	

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
DETERMINING SURVEILLANCE ACTIVITIES In this module and associated classroom exercise, the student obtains the insights and skills necessary to identify specific surveillance activities. Activities are performed by the Government to assure that the outcomes (performance) of the contractor effort match what was contracted for. Although many may seem to be "routine" business management activities, they should be chosen to align with the project strategy and operate in concert with the insight/oversight style. In the strategy session, the group decided the overall approach (means) to achieve the project surveillance end. In this session, the group will learn of the types of surveillance activities (detailed means) available to execute surveillance.	Slide #4A-1
INSIGHTS FOR PLANNING SURVEILLANCE ACTIVITIES Two quotes are offered for insight. Epictetus was on target more than 2000 years ago. The objective in developing activities (actions) is to assure that the Government obtains the product for which it contracted. That is the constant. The variability of materials of action reflects the opportunity to choose among a substantial range of possible activities. Shakespeare offers the obsversation that sometimes actions serve only to continue vices. As activities are chosen, it is prudent to assure that they truly contribute to the outcomes that are desired.	Slide #4A-2
LEARNING OBJECTIVE Upon completion of this lesson, the student will be able to identify the differing types of surveillance activities, articulate the nature of the insights provided by representative types of activities, and link the activities to various types of surveillance strategies. The key here is for the student to gain insight into what activities are effective (doing the right thing) within the context of the contract. The lesson provides insights into critical analysis of various forms of activities to determine the value added and related cost of doing it. A primary means of testing each activity is the question, "Does it add value to the product, service, or NASA organization?" If not, the activity should be reconsidered.	Slide #4A-3

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
OVERVIEW This slide provides an overview of the topics that are covered in this lesson. Initially, some basic tenets of surveillance activities will be reviewed: source of activity, nature of activity, resources, and reason for activity. From there, the lesson defines surveillance activities in terms of the general classes of communications, assurance, or verification and provides specific examples of each type. A special subclass of surveillance/management activities that can be specified in support of a risk reduction strategy for the overall project will also be addressed. To guide individual teams in developing activities, the lesson introduces a checklist/validation form that can be used to cross-check each activity to assure that its purpose is not replicated by some other activity and to confirm that it is in concert with overall surveillance strategy. The final check on designating surveillance activities is the resource sanity check. Before designating an activity, the team must assure that people are available to do the work (or resources available to outsource it). Balanced activities, fully resourced and supportive of the overall strategy, are absolutely essential.	Slide #4A-4

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
BASIC PRINCIPLES OF SURVEILLANCE ACTIVITIES Surveillance activities are a direct extension of the strategies and, in many ways, can be seen as part of the execution strategy level of planning. For the purpose of development of the Project Surveillance Plan, surveillance activities are the planned one-time and recurring events that provide assurance that the contractor is capable of producing the desired goods and services as defined by the contract requirements. They extend verification that the delivered items meet the requirements and offer communication on a continuing basis that documents legally binding activities and instructions between the contractor and the Agency. Every strategy decision describing coordination of resources and activities (middle tier) requires the employment of some form of surveillance activity to make it happen. Examples of strategy-enabling activities include performance monitoring using non-intrusive insight-producing activities, direct oversight activities in high-risk areas, issue-resolution activities designed to eliminate issue areas, and risk-mitigation activities designed to reduce the probability of occurrence or severity of impact for critical failure modes. When describing the surveillance supporting activities, the PSP team must be mindful of the necessity to gauge timing, context, and expense and factor them into answering the question "does it add value?" If the intended surveillance activity is not traceable to a surveillance strategy, is not required by legislation, and is not an absolute first-order contributor to personnel safety, then it should be reviewed for its contribution to project success. "Nice to have" or "always done it that way before" in these days of austerity is not enough justification to continue non-contributing NASA performance surveillance activities.	Slide #4A-5

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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

SPECIFYING SURVEILLANCE ACTIVITIES

Surveillance activities fall into one of three basic areas of classification. Each of these areas will be discussed in greater detail later in this presentation, but will be summarized at this point in the lesson.

Communication is the exchange of oral information and written correspondence and documentation between any and all parties related to the performance of the contracted effort. The communication may be either formal or informal and may have many forms, ranging from an ad hoc conference by the water cooler to formal letters approving the delivery of products. The important concept to gather here is that communication is an essential aspect of the surveillance program and that it involves everyone in both Government and the contractor organizations. Since many communications from the Government to the contractor may be construed as a modification to the contract or specific required performance, all parties must be particularly attentive to the implications of their words.

Assurance activities are primarily for the benefit of the Government. They allow the Government the ability to inspect, observe, evaluate, and otherwise scrutinize contractor business processes for compliance with contractually binding work provisions. The more common assurance activities include audits, observation, formal review, and evaluation of processes, procedures, designs, materials, and personnel activities. Assurance is designed to reduce risk two ways. If the contractor follows Government-mandated processes to the letter and builds the approved design using approved materials, it is assumed that the output product will be acceptable to the Government (protects the contractor from government legal action). Similarly, when the Government receives a product developed using the approved method, then it can assume that the product will work as intended (removes some risk). Assurance activities, although designed to reduce Government

Slide #4A-6

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SPECIFYING SURVEILLANCE ACTIVITIES risk, actually reduce contractor risk to a greater degree than they provide assurance that the desired product will emerge. Verification activities provide the Government a last step to confirm that the product being delivered is the one described by the contract. Classic verification techniques have included inspection, test, and results analysis to determine if the item indeed complies with specifications or performance requirements. In the PBC environment, verification may become more difficult to conduct, particularly when the only metrics are pre-specified performance objectives that may not be capable of evaluation until the product is used. In the past, once the product was accepted, the Government assumed all risk for operations once and for all. Under PBC, some contractors have begun to offer warranties of performance that extend beyond the delivery, a condition more in line with commercial services. The future of verification may become no more than a receipt inspection to verify that everything the contractor said was shipped was indeed received in operable condition.	**Slide #4A-6 (concluded)**
COMMUNICATIONS ACTIVITIES Communications are the backbone for all surveillance activities. As in almost every other realm of human endeavor, open and free communication determines much of the success of a task. Business, despite all the idealized models, is about relationships, and relationships are built on communications. In some rare cases, the communications may be minimalist (like a man going shopping - he looks around the store and sees what is wanted, takes it to check out, pays for the purchase, and leaves without even saying a word). The Government can in some cases execute this form of purchase of goods or services; however, this non-communicative process is	**Slide #4A-7**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
COMMUNICATIONS ACTIVITIES (CONCLUDED) not applicable to most performance-based contracting efforts. The Government must be open in its communication of what it wants and how it is to be delivered; the contractor must be attentive to the requirements and ask for clarification whenever a requirement is not fully and completely understood. Written (or record) correspondence is essential in conducting business in modern society. Establishing what is agreed upon between the parties, documenting what has been done, and establishing what has been accepted provide the evidence needed by both sides to come to the conclusion of a contract.	Slide #4A-7 (concluded)
EXAMPLES OF SURVEILLANCE-RELATED WRITTEN COMMUNICATIONS ACTIVITIES The types and forms of written communications are as diverse as the products and services being acquired. This slide provides a ready source of expected surveillance-related written/record communications that may be used in the satisfaction of the PBC and included in the team's PSP. Traditionally, the form, format, frequency, and content of this communication were specified in the contract and further defined in Government-generated specifications [data item descriptions (DID)]. Performance-based contracting has the potential to change this procedure. However, the PSP should identify the communications products necessary to document successful assurance activity completion or verification and acceptance of deliverable items. It should identify how the communication process will be conducted and what constitutes an acceptable level of communication during the period of performance. Two questions should guide selection: • Does the requested communication add tangible value to the product or service being delivered? • Does the communication satisfy a requirement of contractual law generally encountered in business?	Slide #4A-8

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
EXAMPLES OF SURVEILLANCE-RELATED WRITTEN COMMUNICATIONS ACTIVITIES As a matter of practice, communications can be a solid clue to determining contractor overall performance. Continuously late, incomplete, or unclear written communications seem to conceal rather than demonstrate accomplishment. Similarly, Government correspondence should clearly articulate acceptance, provide performance feedback, or provide direction in a way upon which the contractor can act. Written communication frequently reflects the tone of the relationship and is a ready barometer to measure Government attitude towards the contractor organization.	**Slide #4A-8 (concluded)**
EXAMPLES OF SURVEILLANCE-RELATED ORAL COMMUNICATIONS ACTIVITIES If written communications cement the business relationship in the courts of law, oral communications lubricate the wheels of progress in the day-to-day arena of commerce. Open oral communication is absolutely essential between all members of the teams (contractor and Government), guided by the policy and direction of the respective leaders of each organization and respect of the personhood of all concerned parties. Frequent communications allow the interpersonal exchange of ideas, concepts, and experiences and often lead to ways to improve the overall process. A single caution is provided in defining the set of oral communications for the PSP: if at all possible, do not define them. Informal verbal communications are best kept that way, informal. The requirement for formal, recurring oral communications is best wrapped up in some form of assurance activity rather than called out as a required activity.	**Slide #4A-9**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
ASSURANCE ACTIVITIES	Slide #4A-10

ASSURANCE ACTIVITIES

As described earlier, the Government either performs assurance activities directly or induces the contractor to perform these activities to provide assurances that the design, materials, and processes of product production will result in a product with the necessary characteristics to perform as needed. In contracts in which the Government shares a large portion of the risk for product performance (usually cost plus contracts), continuing review of processes and procedures is one of the few assurances that the product will have the essential physical characteristics embodied in design documents. Assurance activities (with one exception) seldom are able to determine the adequacy of the design or technical approach to meeting the need; they determine only that the item is being produced following practices that, if followed, will produce the designed product. The inadequacy of procedures, processes, or materials is considered as evidence that the product will not have the necessary characteristics to perform as intended. Correction of deviations, requests for waiver, and notices of non-conformance are all activities and documentation related to the assurance activity.

The only assurance activities that can provide assurance of design adequacy is the product design review and corrective engineering change process. The product design review provides the opportunity for the contractor to demonstrate to the Government how it intends to physically and procedurally meet the requirements of the contract. Requirements flow down, systems engineering requirements allocation, calculations of reliability, failure mode analysis, logistics systems analysis, and a multitude of related techniques are employed as a means of assuring everyone concerned that the total design is adequate.

	Course Number:
DETAILED OUTLINE OF INSTRUCTION FOR LESSON 4A: DETERMINING SURVEILLANCE ACTIVITIES	**Module: 4A**
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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
ASSURANCE ACTIVITIES Depending on the contract, the Government may not take the role of approving the design (or change requests), but may only request review as a means of demonstrating contractor competence in meeting requirements. Performance-based contracting efforts will likely take this position with increasing frequency as the doctrine of paying for contractor results becomes the governing way of doing business. Surveillance using assurance activities is a key element that must be resolved immediately in the PSP strategy and held to firmly in the identification of surveillance activities. In short, the Government must determine the level of assurance surveillance by project stage and by project activity and determine how much of the activity it must perform to obtain the necessary level of comfort. Whenever possible, the PSP team should estimate the cost of performing the activity and again ask the question "Does this Government-conducted surveillance activity add value to the product?" If not, consider asking the contractor to perform the activity within its own program and communicate the results to the Government through routine reports.	Slide #4A-10 (concluded)
EXAMPLES OF ASSURANCE ACTIVITIES Reviews and evaluations at critical stages of the project are most helpful in providing assurance that the contractor has thoroughly planned the next stage of activity, has successfully resolved a deficiency, or has completed a design in a way that will meet requirements and is ready for execution. Reviews may be internal as well as external. Government roles in each are contingent on the level of oversight strategy being followed.	Slide #4A-11

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
EXAMPLES OF ASSURANCE ACTIVITIES (CONCLUDED) Depending on the contract, the Government may not take the role of approving the contractor's reviewed products, but may only request review as a means of demonstrating contractor competence in meeting requirements. In other cases, the government may use the review as a formal means of accepting proposed designs, as a method of changing requirements, and in some cases, as a means of formal communication of displeasure resulting from the contractor not meeting objectives. With the shift towards PBC, the PSP must be creative in selecting reviews that will provide assurance that the requirements are being met. Independent reviews are increasingly important to both parties in the contract. This outside evaluator has not vested interest in sorting out who has the "better" process or procedure for accomplishing an objective; they just determine if the objectives will be met with the processes and procedures being used. (Recall that in PBC, the contractor is deeded the risk in assuring that its solution works). Insight monitoring will require a greater reliance on selective reviews to assure that project technical issues are being resolved and that progress is being made towards meeting overall objectives.	Slide #4A-11
EXAMPLES OF ASSURANCE ACTIVITIES (CONCLUDED) Audits are one way of conducting assurance "mini-reviews" of the contractor's work processes. They are the primary way of ascertaining if in-place processes and procedures comply with contractual provisions or with the contractor's own internal intent for performance. Audits can provide insight into the contractor's QA program adequacy in terms of completeness, accuracy, and timeliness. Audits also provide an opportunity to examine the overall systems engineering discipline for use of configuration management principles, systems integration practices, product performance test and evaluation practices, and documentation practices. Well-run, comprehensive programs with few observations of gross deficiency provide the needed assurance of contractor performance.	Slide #4A-12

DETAILED OUTLINE OF INSTRUCTION FOR LESSON 4A: DETERMINING SURVEILLANCE ACTIVITIES	Course Number:
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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

PERFORMANCE VERIFICATION ACTIVITIES Performance verification activities differ dramatically from assurance activities, yet serve to provide the same confidence that the product delivered meets stated needs. The contract statement of work defines the essential performance characteristics of the end product. Verification activities are intended to provide the Government the needed assurance that the items being delivered satisfy those requirements using whatever measures are needed to demonstrate adequacy. Some key characteristics are shown on this slide. In addition to verifying the satisfaction of key performance characteristics, these verification activities can also establish the satisfaction of contractual requirements of timeliness, quantity, and performance location. Again, depending on the nature of the product, the level of confidence held by the Government, and the results of prior verification activities, the Government may modify the scope and scale of activities. As previously discussed, costs for performing the verification activity should be combined with the expected benefit to determine if the verification activity adds value to the outcome.	Slide #4A-13

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
PERFORMANCE VERIFICATION ACTIVITIES Performance-based contracting efforts will probably place more emphasis on verification than assurance activities; however, a well-reasoned strategy supporting verification over assurance should be in place. If the contractor is already performing performance verification and has a superior internal quality program with demonstrated high build quality, then the necessity for much more than minimal levels of verification seems wasteful. Additionally, PSP verification activities probably should key the level of verification activity to demonstrated performance and program life-cycle stage. Early stages of an immature process with unknown build quality seem to intuitively require higher levels of verification activities. As the contractor proves its ability to perform, verification may be focused on determining if the same high quality level has been maintained. Tailoring of management approach to verification appears to be a reasonable element of the PSP.	Slide #4A-13 (concluded)
EXAMPLES OF PERFORMANCE VERIFICATION ACTIVITIES Inspection is the most common, least expensive verification activity available to the Government. The processes requires checking the output product, process, or input materials/components against the product design or specification to assure conformance. The primary limitation of inspection is that it cannot verify whether the item or process has the required level of performance, only if it is in compliance with the when fabricating an item. Certainly, some inspections will be mandatory for the purpose of Government design or written procedure. For example, an inspection can determine if the contractor is using a certain aluminum alloy when machining a part, if the facility meets OSHA requirements, if the "as-built" assembly is the same as the "as-designed" assembly, or if the assemblers are following assembly instructions when fabricating an item. Certainly, some inspections will be mandatory for the purpose of Government acceptance. Careful design of the inspection process	Slide #4A-14

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
EXAMPLES OF PERFORMANCE VERIFICATION ACTIVITIES **using tools such as lot sampling can result in significant savings as NASA and DCMC move from 100 percent inspection rules. However, when mandating inspections, remember that the inspection process can only ascertain compliance, not determine if the product performance is adequate.** ** As in all other surveillance activities, the PSP team will need to rely on the articulated project surveillance strategy to determine the scope, scale, and timing of inspection activities. The concept of "value added" must be considered at all times.**	**Slide #4A-14 (concluded)**
EXAMPLES OF PERFORMANCE VERIFICATION ACTIVITIES (CONTINUED) ** Analysis is the second best product performance predictor tool available and the next most expensive means of verification. The activity of analytical verification generally requires the decomposition, literally, virtually, or figuratively, of the item or assembly in question to determine if the product, design, or process will achieve the technical performance objectives. It is used frequently during the design phase for independent verification of design parameters, integration concepts, and component inherent characteristics (reliability, durability, compatibility, etc.) related to system performance. Some analysis may be destructive, requiring a physical sample to be analyzed for actual composition, fabrication, or physical characteristics of tensile and brittle strength, malleability, fracture propagation, and related material characteristics. This low-level material analysis can then be extended into an engineering analysis to characterize the expected performance of an assembly or component and, ultimately, the completed product. Systems analysis then extends the performance characteristics into analysis of the product in the intended operational environment. Worst case and failure analysis, impact assessment, and mission effectiveness analysis can then be performed to provide initial estimates for the purpose of performance verification.**	**Slide #4A-15**

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EXAMPLES OF PERFORMANCE VERIFICATION ACTIVITIES (CONTINUED)
 	
    A recurring form of performance analysis is metrics data analysis for identification of trends, non-conformance, efficiency, effectiveness, or contract performance. The continuing analytical view of key indicators can be used to prompt preventive management actions, to begin inquiries, and to plan future activities.
 	
    From an insight monitoring point of view, the Government has the option of taking any number of approaches to analysis.   When the program has significant risk, detailed independent analysis coupled with a "go slow - better to get it right the first time than do it over again" management approach can prevent significant oversights and expensive mis-starts.   On the other hand, in low-risk situations, when a proven design or well-understood procedure is being performed by a seasoned contractor team, then much less performance verification analysis is required. The other key point is that the Government must make a difficult decision on who is to perform the verification analysis.   Equally capable teams, both internal and external to the Government, are available; however, if time is a critical factor, use of an independent contractor may result in more timely, less politically influenced response.
	Slide #4A-15 (concluded)

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
EXAMPLES OF PERFORMANCE VERIFICATION ACTIVITIES (CONCLUDED) The final examples of performance verification activities fall into the general category of testing. Testing is the most time consuming and expensive verification technique available. Testing requires the simulation of the mission environment (or its extremes) and the operation of the component, assembly, or end item in that environment. It is the most straightforward means to prove that the item meets performance requirements. A key aspect of testing is assuring that sufficient trials are completed to gain statistical confidence in the outcome. One failure or one success does not necessarily provide sufficient data to make a fair assessment. In some cases, the test results can be used to feed back into analysis techniques when full-up testing costs are prohibitive. As in other verification activities, preplanning and integration of tests into a master test plan can be helpful and a needed means to obtain coordination among the various involved groups. The PSP is the beginning point for the development of a test plan, with the "value added" question used to filter out extraneous or limited benefit tests.	Slide #4A-16
AREAS OF SURVEILLANCE ACTIVITY APPLICATION At this point, it may be instructive to recall why the project staff conducts surveillance of the contractor's performance. Over the years, managers have become accountable for efficient and effective performance of assigned tasks. At the most basic level, this accountability extends to every organization that falls under the control of the manager, including those contracted with to perform assigned tasks. This accountability for performance requires a level of awareness of the efforts ongoing at all levels of the supporting organization sufficient to make judgment of the efficiency and effectiveness of those people (firms) conducting those assigned tasks. Awareness requires information, and information can be gained in multiple ways.	Slide #4A-17

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
AREAS OF SURVEILLANCE ACTIVITY APPLICATION Asking supporting groups for information about their organization's and their product's performance can often result in multitudes of management reports, reams of number laden sheets, and scores of e-mail status reports. Obtaining performance information first hand often involves observing the work being done using informal tours of the work environment, performing "management by walking around," conducting direct inspections, analyzing data base or schedule data directly, or becoming part of a project team. Others can also be asked to gather data and make it into useful information for managers. Project staffs, independent contractors, and supporting other Government agencies all become part of the source of information to assure managerial awareness. This gathering of information for the purpose of managing is the heart of surveillance. Managers observe, measure, gather, analyze, and send others to do the same because, as the manager, they are responsible for and accountable for the performance results in their areas of responsibility. Four general areas of surveillance allow the project staff to perform their project management duties. Monitoring of general project health often uses a stock set of activities involving communications, project assurance, and product verification. Written project status reports, updates to the project status graphs and charts, informal and formal briefings, deliverable transmittal letters, and fund expenditure reports are all expected minimum information items. Product verification inspections, process audits, and assurance reviews of all types provide general information that, with interpretation, can tell the manager about the general "health" of the project. The information is generic in nature and can be likened to the pulse, blood pressure, and temperature of a human body. They are but indicators of health and, when any of them stray from "acceptable" limits, then diagnosis must take place in order to prescribe corrective treatment.	Slide #4A-17 (continued)

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
AREAS OF SURVEILLANCE ACTIVITY APPLICATION Surveillance activities that verify satisfaction of the contract obligation, critical issue resolution, or risk reduction are usually specialized, using the areas of analysis and inspection, and are customized to the needs of the product. The PSP team must identify what it will take to verify satisfaction of these items in the PSP.	**Slide #4A-17 (concluded)**
CHECKLIST FOR SPECIFYING SURVEILLANCE ACTIVITIES This chart is virtually self explanatory. When the team builds the PSP, use of a form or data table/data base with these essential fields of information will facilitate identification of surveillance activities that will be included in the PSP and the surveillance program budget. Completeness in filling out this table will force clear thinking and linkage of activities back to the surveillance strategies articulated previously. In the development of the team PSP in the next few hours, each person will have the opportunity to develop the necessary activities. One caution: frequently, multiple activities may be rolled up into one, making it difficult to articulate the purpose of the activity. The PSP should be specific whenever possible and focus only on things that the PSP project team will do. That is their business. The PSP team will have the opportunity to complete plan review as an assurance activity and then provide inputs.	**Slide #4A-18**

DETAILED OUTLINE OF INSTRUCTION FOR LESSON 4A: DETERMINING SURVEILLANCE ACTIVITIES	Course Number:
	Module: 4A

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
IDENTIFYING AND CONSTRAINING SURVEILLANCE ACTIVITIES Recalling the previous discussion, the Project Manager and staff are one element in a rather long chain of managers, each with his own definition of how much surveillance information is needed to manage for performance. The information needs of an upper-level manager at an HQ functional office, Center Program Manager's Office, or DCMC regional HQ may not necessarily be in line with the "lean and mean" approach taken by the PSP team and may lead to the inclusion of additional activities. The PSP team must at this point make the tough decisions, based on value added, power structure, and cost to execute, concerning which activities stay and which go, or whether additional resources should be sought to conduct the surveillance activity. The bottom line is that surveillance activities must be sufficient to allow managers the needed insights to assure project success. Project success may be spelled many different ways to different people, but at the contract-project management level, it is spelled strictly in terms of the contract that binds the contractor to deliver specific goods and services using a manner and method acceptable to the Government. All else is extra. The PSP team has a responsibility to estimate a cost for these activities, in terms of labor requirements, capital resources, and equipment. From this basis, the Project Manager and PSP team can make the decisions on which activities to include and which to exclude.	Slide #4A-19

SUMMARY

Slide #4A-20

This lesson has focused on understanding what a Project Surveillance Plan is all about and how to create one. It has examined the role of multiple levels of strategy in providing a progressive, logical flow of translating project and Agency objectives into specific policies, marrying intent to resources, and mapping a method of execution into specific surveillance activities. A key point to recall is that to make this mapping happen, the PSP authoring team must have a clear, unhindered view of *all* the background of the contractor and the Agency in similar projects, of the entire contract vehicle and contractor proposal, and of the project budgets including both projected contractor payments and NASA project management. With this information, the team can attack its task of establishing a coherent strategy that reflects reality (how it really is) rather than fantasy (how it is hoped to be).

When identifying candidate surveillance activities for inclusion in the PSP, the team should pass the item through a two-stage filter. First stage asks if the activity brings value to the contractor's product (or if not doing it directly takes away value) and then determines if the activity provides insight into critical contractor processes and outcomes. Tailoring the activities and strategy to the life cycle of the project and contract is critical. Early stages may require a greater level of process and procedure oversight until the agency obtains the needed level of assurance that the contractor seems to be a well-run business entity capable of delivering the services and goods requested and that the resulting product or service meets agency needs. Once those predefined hurdles are cleared, then adjustments in strategy and surveillance activities can be made to adjust to a greater reliance on insight-based performance-monitoring activities.

	Course Number:
DETAILED OUTLINE OF INSTRUCTION FOR LESSON 5: LABORATORY - DETERMINING SURVEILLANCE ACTIVITIES	**Module: 5**
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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

DETERMINING SURVEILLANCE ACTIVITIES

Slide #5-1

This module provides an introduction to the workshop and its format. The actual format of the workshop will depend intrinsically on the tasking for instruction.

This laboratory is designed for small group interaction in the formulation of a family of coherent strategies that support the project management. These strategies are realized in the determination of surveillance activities. The approach reflects a Socratic approach of structured questions that allow the group to reach consensus in determining their specific course of action. Worksheets and background problem sheets are provided with this package to facilitate discussion, structure outcomes, and provide records of decisions reached in the group. In addition, each class member will have a copy of a sample Program Surveillance Plan (PSP) for the fictitious IO3 project for use as a reference.

In some cases, the instructor may be guiding a group that is actually developing a Project Surveillance Plan. In that case, a worksheet for project information gathering should be used. Our recommendation is to forward this worksheet to group members ten days before the workshop for completion and use in developing major sections of the group's PSP.

The recommended group size is five people; however, up to eight persons may be assigned to a group. Whenever possible, create and use multi-disciplinary teams composed of engineering, procurement, quality, and project management specialists for these exercises.

Groups require separate breakout areas to complete their exercises prior to returning to the main meeting room.

The application of the concepts of strategy formation and activity identification become reality in this 2.5 hour laboratory. Student teams will be tasked to develop relevant strategies for a sample problem or for one that they face in their organization.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
INTRODUCTION Open for any comments for the instructor. Recommend that instructor set a time limit and sketch out expectations for this module. Iterate that the quality of the learning experience is dependent on the individual as he or she learns to work in a pressured group dynamic environment with specific tasking and room for interpretation.	**Slide #5-2** <u>Note</u>: Confirm that each person has a full set of lesson handouts: Student Project, worksheets, and the IO3 PSP
REVIEW OF PAST LESSON The past lecture should have left students overwhelmed by new terminology, paradigm shifts, and technically complex methods for evaluation and synthesis. Refresh the following concepts. • Understanding the problem takes time and effort. Assume nothing; find out for certain. If a decision has yet to be reached on a critical element of the approach, document the assumption and its impact. • NASA surveillance activities must add insight into performance or be structured to resolve critical issues. If not, they belong in the trash or in the contractor's program. Remember, NASA is not executing the project – the contractor is. • Surveillance activities will change in their relative importance as the project matures. Design review assurance activities will give way to performance verification activities. Communication must be a constant factor to allow insights. Think non-intrusion when conducting surveillance activities. Activities should support strategy. All strategies should mesh. There is no room for conflicting or non-complementary strategies. Strategies depend on many complex factors that reflect the interpersonal relationships of contractors and NASA.	**Slide #5-3**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
LEARNING OBJECTIVES Students will obtain hands-on experience in the following critical areas: • Group collaboration skills in a multi-disciplinary team • Project environment analysis and situation assessment leading to synthesized solutions • Specification of surveillance activities in three areas Success in the rapidly changing environment of NASA requires the ability to dissect, analyze, synthesize, and integrate information and provide novel solutions to emerging problems. Experiences of what works acquired in the past must be critically evaluated and appropriate methods developed to direct future courses of action. Concentration on principles rather than business terminology has the best potential for pay off when selecting courses of action.	**Slide #5-4**
TASK ASSIGNMENT Formally charge each group to review the integrated project surveillance strategy and identify surveillance activities to accomplish the student project. Provide a time limit and specify location and time of debrief. Stress that PBC will be used in this procurement.	**Slide #5-5**
PSP AUTHORING TEAM ASSIGNMENT CONFIRMATION Review who is on each team and their working location.	**Slide #5-6**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
STUDENT RESOURCES REVIEW Determine the workroom resources. Review the handouts: Activities and IO3 Project Surveillance Plan.	**Slide #5-7, 5-8**
SUGGESTED TEAM WORKING ARRANGEMENTS TQM training has suggested that a structured work group approach is one way to approach collaborative, multi-functional team functions. For this exercise, the group works for the instructor (a surrogate of the Project Manager). A group facilitator leads the group in accomplishing the tasks assigned to the team. The recorder takes notes (preferably on large media) so that everyone can see the group progress and revisit past decisions. The timekeeper helps the facilitator keep on track and limits group talkers to an agreed time (less than 2 minutes). A brief agenda prepared by the facilitator guides the discussion and team problem solving. There may be opportunities for small group/functional huddling to develop requirements and refine activities. A brief summary of outcomes should be developed from the worksheets. This may be presented to the larger class for critique or review. (Instructor should limit this to two groups unless time is available.)	**Slide #5-9**
TEAM PRESENTATIONS AND CRITIQUE Conduct a seminar debrief. Select two groups to present their outcomes using this slide as a guide. Guide the critique towards positive elements and identify opportunities for improvement. Focus on the synergism that the group experienced in this critical first task.	**Slide #5-10**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
PREPARATION FOR NEXT LESSON Prepare the students for the next block of the course by tasking them to review the critical issues related to the project. Specifically ask for them to look for ways that insights into both contractor performance and issue resolution can be gained through use of performance-related information. Students should make preliminary assessment of potential metrics that might be constructed to support insight formation while remaining congruent with the strategy and ongoing activities. If a metric can be identified, students should think about what constitutes acceptable limits and determine management "rules" up front.	**Slide # 5-11**

Strategy Formation Worksheet

I. Level of Strategy: ☐ **Policy**
☐ **Resource and Activity Coordination**
☐ **Execution Processes**

II. Strategy Articulation: _____

_____

_____

_____

III. Supports which higher level objective/strategy? _____

_____

_____

_____

IV. This strategy is applicable to which phases of the project/contract life cycle?

_____

_____

V. What prior issues will this strategy resolve? _____

_____

_____

VI. How does this strategy add value to the project management process? Have you any evidence to support this claim? Describe. (optional)

Strategy - Activity Flowdown Worksheet

$\wedge$

POLICY

/ \

Resource and Policy
Coordination

/_____\

Execution/Activities
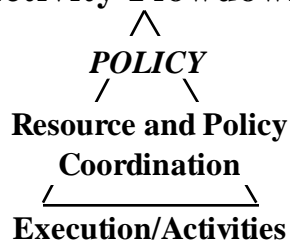
I. Policy Strategy: _____

_____

II. Supporting Resource and Activity Coordination Strategies _____

_____

_____

_____

_____

III. Supporting Surveillance Execution Process or Surveillance Activities:

_____

_____

_____

_____

_____

_____

Activity Definition Worksheet

Activity Description: _____

_____

Purpose: _____

Supported Strategy: _____

Expected Benefit: _____

Frequency: _____

Duration: _____

Extent of Activity (locations): _____

Estimated Resource Requirements

Expense Category	Work Years	Expense
NASA Personnel		
Other Government Agency		
Support Contractor		
Materials and Facilities		
Totals		

Strategy - Background Analysis

Expected Contract Type _____

How is the contract incentive structured? _____

Describe NASA's technology background for this project.

- ☐ First Time Technology Demonstrated
- ☐ New Application of Demonstrated Technology
- ☐ Previously Demonstrated, but Still New

- ☐ Proven Technology
- ☐ Incremental Improvement Only
- ☐ Major Revision/Upgrade

Remarks: _____

_____

NASA project management background for this project:

☐ Inexperienced PM	☐ Uncertain Team Organization	☐ First-ever PBC
☐ Limited Experience PM	☐ Matrixed Team Organization	☐ Limited PBC Experience
☐ Seasoned PM	☐ Dedicated Project Team	☐ Extensive PBC Experience

Remarks: _____

_____

Expected Project Issues: _____

_____

_____

_____

Project Risk Potential: **(1 - low; 5 - high)**

Funding Stability	☐	**Complexity**	☐
Technology Maturity	☐	**Contractor Base Capability**	☐
Cost Realism	☐	**Schedule Realism**	☐
Popularity	☐	**Excitement Factor**	☐

Surveillance Activity Definition Worksheet

(complete 1 sheet for each activity)

Activity Description: _____

_____

Type of Activity: ☐ **Communication** ☐ **Verification**
☐ **Assurance**

Purpose: _____

Expected Benefit: _____

Frequency: _____

Duration: _____

Scope of Activity: _____

Estimated Resource Requirements

Expense Category	Work Years	Expense
NASA Personnel		
Other Govt. Agency		
Support Contractor		
Materials & Facilities		
Totals		

10/21/96

Project Surveillance Strategy - Background Analysis

Expected Contract Type: _____

How is the Contract Incentive Structured? _____

_____

Describe NASA's Technology Background for this Project.

- ❑ **First Time Technology Demonstrated**
- ❑ **New Application of Demonstrated Technology**
- ❑ **Previously Demonstrated, but still new**

- ❑ **Proven Technology**
- ❑ **Incremental Improvement Only**
- ❑ **Major Revision / Upgrade**

Remarks: _____

_____

NASA Project Management Background for this Project:

❑ **Inexperienced PM**	❑ **Uncertain Team Organization**	❑ **First ever PBC**
❑ **Limited Experience PM**	❑ **Matrixed Team Organization**	❑ **Limited PBC Experience**
❑ **Seasoned PM**	❑ **Dedicated Project Team**	❑ **Extensive PBC Experience**

Remarks: _____

_____

Expected Project Issues: _____

_____
_____
_____

Project Risk Potential: (1 - low; 5 - high)

Funding Stability	☐	**Complexity**	☐
Technology Maturity	☐	**Contractor Base Capability**	☐
Cost Realism	☐	**Schedule Realism**	☐
Popularity	☐	**Excitement Factor**	☐

Strategy Formation Worksheet

I. Identify the primary Policy Guidance / Directives /Initiative applicable to this Project.

_____

_____

_____

_____

II. What are the general outcomes expected from surveillance of the contractor's efforts?

_____

_____

_____

_____

_____

_____

III. What means will you use to assure Policy Compliance / Satisfaction?

_____

_____

_____

_____

_____

IV. What means will you use to assure that desired surveillance outcomes happen?

_____

_____

_____

_____

_____

_____

_____

Strategy Formation Worksheet (2)

V. What means will you use to deal with historical problems?

_____

_____

_____

_____

_____

VI. What means will you use to manage project risk?

_____

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VII. Explain how you will change your strategy / approach over the project life cycle

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VIII. Which of these strategies reflect known "best of class" benchmarked approaches to assuring high quality outcomes?

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Strategy Formation Worksheet (3)

Summarize your surveillance strategy in 2 paragraphs or less

DETAILED OUTLINE OF INSTRUCTION FOR LESSON 6: ESTABLISHING PERFORMANCE METRICS FOR PROJECT SURVEILLANCE	Course Number:
	Module: 6
INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
ESTABLISHING PERFORMANCE METRICS FOR PROJECT SURVEILLANCE This lesson provides students with the insight and theoretical background necessary to identify and create useful metrics for inclusion in a Project Surveillance Plan. Building on the background of strategy formation and activity specification, this lesson provides a logical continuation that provides the "how-to" required to execute management control of any project. It is particularly suited for use in performance-based contacting efforts in which an important objective is to assess contractor performance in a non-intrusive, insight-focused manner.	**Slide #6-1**
REVIEW OF PAST LESSON The past two lessons have covered the concepts of strategy formation and surveillance activities definition. Students have had the opportunity to frame a workable strategy and merge it with a specific management style. As part of the available activities for surveillance, the generic areas of communications, assurance, and verification came to the forefront. By balancing these activities to meet available resources and remain in concert with surveillance strategy, it became acutely obvious what adds value and what does not. This lesson requires the student to build on that information while keeping the same critical mindset, to learn some new information about metrics, and then to use all this information in the next workshop session. Metrics are very likely the predominant tool that the project team will use in the management of the project and contractor output.	**Slide #6-2**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
INTRODUCTION Metrics are a fact of life and have been since man invented trade. Because business is based on the exchange of value for value, valuation (counting) has been a part of the business world for a long time. When man started tracking items such as sheep, cows, land, and gold, he also started unconsciously tracking things like health (how many cows died), output (how much milk did they give), condition (how dry is the land), and state (how pure is the ore). Obviously, metrics have become an essential part of business life. The difficult part is to decide which measures provide the most information at the least cost so that appropriate actions can be taken. This lesson provides the essentials to developing metrics and using them to guide management actions.	Slide #6-3
LEARNING OBJECTIVES When the student has completed this lesson, he or she should have a good sense of the difference between a good metric, a superior metric, and one that is abysmally lacking any values. Good metrics measure what is important to the organization, providing a view of the dynamics of business while helping to identify trends about the effectiveness and efficiency of the enterprise. This leson provides the tools that can allow a group to define and select good metrics and the insights needed to discriminate between fluff and substance. It illustrates some ways to define control limits and then use them to manage a project. Upon completing this lesson, students will not be able to revamp and rationalize the entire space shuttle metrics program, but they will be able to choose and deploy useful metrics for their project tasking.	Slide #6-4

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
OVERVIEW As in the prior lessons, this lesson takes a building block approach: first define the terms and conditions, then describe the focus of PBC-related metrics, and provide a structure that the team will use when defining the metrics for their PSP. The last section integrates management control and response processes into the metric selection and definition process. A part of the lesson will be devoted to examining what makes a good metric, showing examples from both ends of the spectrum and encouraging the teams to decide why they are good or not so good.	Slide #6-5

WHY ARE METRICS NECESSARY?
 	
     Metrics are an essential step of management control.   The following descibes the classic management control model: *Step 1* - **Decide what should be done, communicate it to the workers, and provide resources for them to do the job.** *Step 2* - **Observe the work being done, measure it, and make certain that performance expectations are being met.** *Step 3* - **Provide corrective feedback to the worker as necessary and work to improve efficiency of resource use.** *Step 4* - **Do-loop to Step 2 until completion or stopping criteria are met.**
 	
     Current management practices employ a concept of self-controlling teams. In this model, the team or individual measures its own process and outputs and corrects its performance internally. This works particularly well when incentives to the team are provided that are based on quality of product, productivity of the group (constant quality, increased output quantity, same labor contribution), or innovation leading to more effective processes (value added, fewer processes, streamlined procedures).
	Slide #6-6

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
WHY ARE METRICS NECESSARY?	Slide #6-6 (concluded)
Metrics are designed to measure performance in both qualitative and quantitative terms. Quantitative terms are relatively easy to spot: number of widgets, pounds of product, years of service. Qualitative terms are easy to spot but are frequently difficult to gather and often harder to interpret: miles per hour, mistakes per 1,000 administrative actions, hardware design changes per new manager per first 100 days on job. In simplest terms, metrics measure performance with the unblinking eye of numbers.	
When management announces a metric, in the PSP or other venue, and starts using it in their management practices, they have explicitly declared what is important to them about the performance of their work unit. Numerous metrics, collected but not used, tend to send another message, that of apathy or management incompetence. If everything is measured, but none of the data is used or acted upon, workers cannot help but have a cynical attitude and begin to engage in game playing with the "system." (How bad can the metric become before anyone pays attention?) Some enterprises commit resources to correcting areas with bad performance metrics (schools and other public services are examples); others commit to helping those that are already good to become even better. The response depends on the orientation of the enterprise.	
DEFINING CHARACTERISTICS OF METRICS	Slide #6-7
Webster's defines the word metric as "a standard of measurement," but for most persons and organizations, a metric is simply a measurement. In the industrial engineering discipline, organizations often set standard rates (metrics) that reflect the observed time to perform a specific repeatable process. Rates such as these become the basis for estimation of job costs. Work performance can then be measured against the standards, and performers either side of the standard can be rewarded accordingly. In many project management endeavors, documented standards of performance may not be available, and if they were available, they would not be appropriate for use.	

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
DEFINING CHARACTERISTICS OF METRICS	**Slide #6-7 (continued)**

DEFINING CHARACTERISTICS OF METRICS

For the purposes of this lesson, a metric is simply a measurement of some aspect of performance. Some metrics are obviously better than others for the purpose of gaining insight for project management. But what makes "good" metrics? Scott Adams identifies the following characteristics of metrics as essential for use in project management.

- Metrics must reflect and be coherent with project management strategy. If management *insight* into the quality of a product produced on a contractor's production line is desired, then measuring every item coming down the line probably is not appropriate. Sampling an occasional randomly chosen item, occasionally monitoring a QA person as he or she performs sampling and assessment, conducting an audit of the discrepancy identification process to determine where discrepant material really went, or reviewing the verification results are examples of insight-producing activities. Results can be reported in tables and graphs to provide insight into the product quality over time.

- Any activity that is really important to the success of the project should have a metric that evaluates its salient features. Quantity, quality, resource consumption, efficiency in creation, and effectiveness in meeting needs are among the bare minimum measures that should reflect the current status of a project.   Use of comparative analysis against benchmarks or past performance can be instructive and useful in management assessment.

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
DEFINING CHARACTERISTICS OF METRICS • **In the same way that achievements are measured in a person's life by differing metrics as he or she ages, so should the project metrics of a system change. Change is normal, but metrics should stay paced with changes in strategy, process, and business environments. During product start-up, labor hours per item produced may be measured to monitor learning curve improvements, but as the process stabilizes and becomes mature, this measurement may not provide much useful information for management action. New metrics should always be added to replace old metrics that no longer fit the organization, product, or market.** • **When metrics are developed using a team, a negotiation between the measured and the measurer can occur. People in management must justify the value of the metric in strategy execution. Workers can learn why management needs the information and negotiate the collection means and use of data. Teams have ways of combining information so that one measurement can be used for multiple purposes, rather than each proceeding in a "stovepipe," functionally oriented, "always done it that way" process. Teams are important to making PBC and the PSP work and to developing good metrics.**	Slide #6-7 (concluded)
ELEMENTS OF EFFECTIVE METRIC SYSTEMS Nancy Lee Hutchin adds the following ideas to the previous discussion. Her key ideas include the use of benchmarks, necessary flexibility of the metric system to meet the needs of the enterprise, and the need to use graphics that completely and accurately tell a story.	Slide #6-8

6242-R3-6

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
ELEMENTS OF EFFECTIVE METRIC SYSTEMS	**Slide #6-8 (concluded)**

ELEMENTS OF EFFECTIVE METRIC SYSTEMS

The concept of benchmarks is simple: comparisons are made between current activity and the best of class, the rest of the class, and the best performance in class. This comparison leads to determining competitive advantage, to setting objectives, and to otherwise determining a strategy for future performance. Although most of these comparisons are applicable to the contractor, it is also important to know how well a contractor compares to others in the industry. Metrics should focus on areas that are determined to be key characteristics directly affecting the integrity of the output product or representing the efficiency of the contractor.

The flexibility of a systems to assess contractor performance is in keeping with the concept of life-cycle tailored metrics. Focusing on assessment of contractor performance on design disciplines is appropriate for early phases of the project. Changing focus to assess configuration control, material control, and production procedures during early production will probably lead to cost control, waste and scrap re- utilization, and refurbishment configuration control in later stages of the project life cycle.

The prime concern after deciding what to measure is how to tell a story (create value with useful information) with the data. As stated on this slide, ideal metric displays show history, control limits, trends, and current status all at once. These data are best shown as dimensionless or at least in relative terms that allow the decision-maker to immediately determine if the data are central to the essential values of the enterprise or project and if something must be done to address the trend or absolute level of performance. The best metric displays tell a story completely in a stand-alone mode that leaves no questions or misleading impressions in the minds of senior reviewers.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS

USE OF METRICS IN PERFORMANCE-BASED CONTRACTING

Metrics and performance-based contracting are inseparable by definition. Performance-based contracting requires the contractor to attain specific performance goals in the delivery of products and services. These goals, which are specified in detail in the contract statement of work, often describe a minimum level of acceptability and an objective level. In addition, incentives may be structured around the attainment of certain work or product quality objectives. Metrics provide a means of measuring the attainment of goals and objectives.

As previously noted by Tom Peters and other management science "gurus," performance tends to follow attention. The classic Hawthorne laboratory experiments illustrate this point well. In this Bell Labs effort, researchers varied the lighting condition as an input variable to worker efficiency. They discovered that no matter how adverse the experimental lighting conditions, worker efficiency improved significantly over a control group. This led to further experimentation and the observation that any attention by management on output results initially resulted in increased worker productivity (*the Hawthorne effect*). Accordingly, if surveillance or measurement of a specific area is increased, it can be reasonably expected that efforts resulting in continuing positive outcomes of this metric can be expected simply because attention is focused on that outcome. The Agency can use this to its advantage to focus contractor attention on particular "hot buttons" as long as the advantage is not abused or inconsistent with overall strategy.

The metrics of a project group's performance most importantly tell the group and the NASA project manager instantly if the contractor team meets technical performance requirements (instant feedback) Similarly, many of the more complex performance metrics, when taken over time or other quantitative measures, can be used to develop a

Slide #6-9

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
USE OF METRICS IN PERFORMANCE-BASED CONTRACTING predictive estimate of future performance. Use of trend lines, cost-estimation relationships, and other statistically based tools can be powerful management tools to avert problems if the metric under consideration is also a leading indicator.	Slide #6-9 (concluded)
USE OF METRICS IN PERFORMANCE-BASED CONTRACTING (CONCLUDED) Project-level metrics collected across a range of projects and contractors can provide the Agency with a needed tool in the transition to performance-based contracting. Without a substantive base of information, project managers may have difficulty in establishing achievable objectives for contractor performance. Performance results, gathered and cataloged in a conscientious manner, provide a basis for performance estimation, benchmark comparison, prediction of success in project completion, issue identification, and risk analysis. Furthermore, depending on the choice of metrics, data can be used to document the cost of quality and to determine the contractor offering the best value to the Government in terms of both compliance and performance. Over a longer term, performance data collected in project execution can be used to evaluate contractor performance and to establish cost estimation relationships based on high-level key characteristics (e.g., cost to orbit an electronics package on a Delta launcher based on the weight of the package and manufacturer).	Slide #6-10 **Reference:** *Augustine's Laws*, Mr. Norman Augustine

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USE OF METRICS IN PERFORMANCE-BASED CONTRACTING (CONCLUDED) Similarly, opening communications within the aerospace industry and pressuring contractors and the Agency to streamline and reduce costs of product development and project execution have led to improved common metrics. These common metrics and single-type processes for all Government and civil procurements are leading to a reduction in Government overhead and oversight in routine procurements and single processes that meet all Government requirements at that facility. The Advanced Quality Systems initiative calls for common metrics, used rigorously to establish project direction and to provide feedback to project managers as well as contractors.	Slide #6-10 (concluded)
DOCUMENTING METRICS IN THE PROJECT SURVEILLANCE PLAN – OVERVIEW When describing metrics in the Project Surveillance Plan, planners should perform a rigorous review of each of the proposed measures and fully justify its inclusion. The presumption in all cases is that the proposed metric is useless unless proven otherwise by competent authority or convincing argument. Business as usual is not acceptable. This chart shows the type of data that should be included for each metric choice and is the minimum to fully define each metric.	Slide #6-11 <u>Note</u>: The next few slides and the practical exercise will serve to explain each section of this metric description. For now, review the slide and set it aside for future reference.

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
METRIC TYPES	Slide #6-12

METRIC TYPES

Metrics types fall into two general areas: objective and subjective measures. Many objective measures are usually first order (observed directly) or second order (outcome reflects an unmeasurable first-order impact). Easiest to observe and measure are those of absolute performance of the product or process. Rigorous, repeatable measurement techniques and calibrated measuring devices are the characteristics of these metrics. This repeatability of measurement process allows multiple observations to be taken over time for the same object or at the same point of the process for multiple objects. From these absolute performance measurements, metrics comparison frequently provides invaluable information concerning the processes, effectiveness, or relative efficiency of methods being used. Some of the more effective management and process performance metrics combine multiple first-order measures to derive indices of effectiveness (output per unit of input). Developers of the PSP should provide a mix of both effectiveness and efficiency measures in the objective realm. Whenever possible, objective measures should be instituted since they are the easiest to use in administering performance incentive programs. The measures are generally incontrovertible, are based on direct observation of performance, and are gathered in a repeatable manner using a "scientific" sampling method.

Slide #6-12

METRIC TYPES (CONCLUDED)

Subjective measures, although much less exacting, are important to project management and should be considered for inclusion in the PSP. Both formal and informal measures of contractor performance using "gut feelings" and "seat of the pants" assessments provide insights into the interpersonal dimension of contractor-Government relations. In some quarters, interpersonal relations are all that make the difference between competing offers, particularly when competing offers on

Slide #6-13

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
METRIC TYPES (CONCLUDED) commodity items have few technical or performance distinctives. This distinctive will become more important in real terms as the Government places more emphasis on streamlined procurements using oral presentations and electronic commerce methods. Although difficult to adjust against, subjective bias on the part of evaluators and project personnel may influence the outcome of performance incentive award decisions and other imprecisely defined performance elements. Informal subjective metrics can be a solid initial basis for formal objective measures. Subjective metrics are most often formed from routine communications activities. Structuring communications activities using win-win strategies and gain-sharing approaches often results in more favorable assessments of contractor performance. In turn, by the effect of positive expectations, these activities can turn a potentially adversarial relationship into a positive situation resulting in overall project success.	Slide #6-13 (concluded) <u>Note</u>: The instructor may wish to discuss topics such as the "halo effect" (less critical assessment of performance due to overall favorable impression) or "slacker effect" (more critical assessment of performance due to any unfavorable impression) as part of the classroom discussion.
SELECTING WHAT TO MEASURE One of the prime problems when structuring the PSP is not so much deciding what to include as is deciding what not to include. This lesson deliberately takes a hard-nosed approach to inclusion that will require the team to "prove" that the metric provides substantive benefit to developing project insight before it is included. As a result, the team is encouraged to find metrics that are information-rich for use in project management. Aside from the selection of metrics that directly reflect the attainment of specific technical performances, consideration of more complex efficiency types of metrics is in order. Metrics that normalize output results with respect to total inputs, that reflect relative rates, that differentiate between environmental conditions and output results, or that in some form capture the human dimension on quality of outputs provide direct evidence for causative factors and allow prediction of key characteristic performance in future endeavors.	Slide #6-14 <u>Note</u>: At this point, solicit student inputs of potential metrics for a sample situation (contractor installation of 1,000 surface tiles on a new orbiter vehicle). Use the brainstorm technique to generate a number of metrics initially. ***Caution:*** **Do not use words like "good metric" or any other means of shaping or affecting input from the class. The next slide will be used to lead the discussion of which metrics should be eliminated from the project management point of view.**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
SELECTING WHAT TO MEASURE (CONCLUDED)	**Slide #6-15**

SELECTING WHAT TO MEASURE (CONCLUDED)

The "key characteristics" of a process or component are among the most productive metrics for directly monitoring critical issues and obtaining needed insight into overall success. Although not always specifically called out, every process or product has key characteristics that make it fit for use. For a hardware example, a drawing may specify using a 3/8" chamfer on the collar of a machined part and locating two holes in it 1.35" apart on-center bored out to an inside diameter of .75" ±.005." Without identification of the key characteristics of the part, it may be rejected for having a collar chamber of 1/4" when in fact the chamfer dimension was not critical to part performance. This concept clearly requires a greater level of attention to total system design and understanding of the issues of "dimension stacking" on key performance characteristics, but it is essential to the concept being taught in this lesson.

From a project management perspective, some critical dimensions/performances require tight monitoring; others require observation only in terms of "dimension stacking" to determine how well the entire process works. Determining the key characteristics of contractor performance is critical and requires critical thought in order to ensure that measures of effectiveness and efficiency are among the repertoire of chosen metrics.

Slide #6-15

Note: The instructor should now lead a discussion to winnow out the most desirable metrics from the previous slide. Document why any discarded metric is not kept. Find a better alternative for each to measure a key characteristic or focus on contractor performance.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
POTENTIAL METRIC AREAS FOR INSIGHT MONITORING OF CONTRACTOR PERFORMANCE 　　Project Managers require a set of metrics that can instantly provide a sense of overall project health, not unlike the basic information that temperature, pulse, and blood pressure readings provide for a person. These metrics should reflect degree of attainment of key project objectives and, if possible, combine factors of resource input and output quantity and quality. Attainment of delivery schedules may be a key characteristic for some processes or products, with particular emphasis provided to critical path attainment. (Example: days of critical path slack compared to days to complete project.) Other metrics may include work day resource used compared to work days to complete (based on work delivered and work in-process). Similarly, the Project Manager may want to keep a continuing eye on the risk index or issue status. Each has a particular flavor to add to the metric mix, but regardless of which ones are chosen, they must add insight to the observations of the Project Manager.	Slide #6-16
METRIC DATA SOURCES AND PROCESSES 　　Whenever possible, data collection by the Agency should use a non-intrusive process. Among the most non-intrusive methods is using the contractor's own project management information system (MIS). If offered, the contractor's MIS should be considered; however, random independent quality assurance spot checks of its integrity should be an unquestioned element of performance surveillance. Prior to use of the contractor's data, the government may wish to "qualify" the input and data processing procedures to assure data corruption is unlikely. Sources of all data being used in performance surveillance should be identified. Standards for acceptance apply to data, just like any other product being delivered to the Agency, Data verification must be included in the list of surveillance activities.	Slide #6-17

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
METRIC DATA SOURCES AND PROCESSES In addition, as a part of assuring integrity of the surveillance process, an independent method for acquisition of incentive related performance data should be considered. Audit and inspection activities (part of assurance and verification) may provide a wealth of information that should be integrated into the overall data management concept. As for contractor-provided data, the source of the data should be indicated.	**Slide #6-17 (concluded)**
METRIC DATA SOURCES AND PROCESSES (CONCLUDED) This slide, which identifies issues that invariably arise when working through data acquisition, is offered as a discussion aid. • *Data Currency.* **Data reporting in corporate MIS often displays a 20 to 45 day lag or longer. Assure raw data have date identification associated with them. Actions taken on old data are reactionary. If only old data are available, use data only for trending. Develop forecast methods that take into account leading indicators of future performance rather than using observed indicators of performance.** • *Data Accuracy.* **Management decisions depend on accurate information. As mentioned previously for incentive processes, the payoff for introduction of spurious information into the objective measurement system could be significant. Independent audit and verification activities should be considered as a matter of practice.** • *Data Element Description/Stability.* **In some cases, data element names have remained the same while the nature of the contents, the way they were gathered, and the way they are processed may change. Data configuration management is essential for use of benchmarks, cost of quality, or other comparative measures. Do not mix differently defined data with the same name on any graphic.**	**Slide #6-18**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
METRIC DATA SOURCES AND PROCESSES (CONCLUDED) • *Access to Raw Data*. **Data may be proprietary and require special protection. Contractors may not want to sell their data, and data may not be offered in their proposal. This is strictly open to negotiation. Be certain that the data are really needed for project management.** • *Data Formats*. **Make certain that data are provided in a usable format. Avoid paper products if possible.** As the team develops its data and metrics plan, assure that it fits with specific job responsibilities (Lesson 8) and with specific activities. Data and metrics interpretation is a full-time job when performed properly.	Slide #6-18 (concluded)
DEFINING CONTROL LIMITS Attempting to manage business using performance-measuring metrics without having a clear concept of acceptable performance will result in a sub-optimal process. Measuring absolute or relative performance without criteria to establish boundaries can be only part of the solution. When using the core management processes, measurement of the performance is the first step of the control process. This step is followed by comparison of the measurement to a standard or objective of performance. If the performance meets standards or if corrective action is required, this information is provided into feedback into the system. The measurement/comparison/feedback process continues unabated during the period of management control. The concept of control limit is straightforward; as long as performance meets, exceeds, is within, or will remain within the established boundaries of desired performance, then the process is considered under control. When the metric indicates that performance no longer complies with or will soon violate the control limit, then the process may need management control action.	Slide #6-19

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DEFINING CONTROL LIMITS	Slide #6-19 (concluded)

DEFINING CONTROL LIMITS

Without a clear description of objective limits of acceptable performance, the concept of a metric is not terribly useful for management. The objective for "doing well" may take many forms, depending on the project strategy and overall project performance objectives. The criteria for "doing well" may also reasonably change over the project life cycle. Acceptable scrap rates during initial production may be higher then they will be during full-scale production. The effect of learning-curve performance enhancements is well understood and frequently anticipated in long-term projects. Similar insights into the infusion of technology into project processes should be included into control limits.

In short, control limits describe what constitutes acceptable performance for that metric and are in many cases dynamic over the project life cycle.

SOURCES OF PERFORMANCE OBJECTIVES   Slide #6-20

If the contract Statement of Work contains objectively defined levels of performance, then they should be the first stopping point for definition of key characteristic control limits. Derived requirements are a secondary source of performance control limits. Fuzzy, non-engineering metric benchmarks and similar project performance from a past period may require a deeper search through related business or NASA internal data bases. Other sources may include benchmark data bases, industry standards, and regulation or legal statutes. In all cases, the control limit for the emerging metric should be fully documented in the PSP, even when it is an extension of a previously established or legally mandated control limit.

As mentioned previously, the advent of PBC and the resulting draw down of Agency personnel will not allow the continuous manual monitoring of all performance status. Selection of metrics and their respective control limits amenable to computer analysis can streamline the task of continuous insight monitoring. Additional analytical forecasts or simple moving-average calculations provide substantial insight to Project Managers.

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS

SETTING CONTROL LIMITS

The business of setting control limits is a technical endeavor that may require the assistance of persons trained in the disciplines of industrial engineering, operations research, or statistics. Some forms of popular control limits are shown in this slide.

The simplest control limits take the form of minimum or maximum value (single-sided limit) and may be extended to encompass both a minimum and maximum level of performance (dual-sided limit). (Example: Residential streets - maximum speed, 25 MPH.; interstates - minimum, 40 MPH, maximum 70 MPH). These limits indicate a "0-1" (all or none) case of acceptability (24 MPH is fully acceptable, 26 MPH is not). In reality, the emerging concepts of "fuzzy logic" allow for ranges of acceptable performance without sharp cutoff conditions (28 MPH - 50 percent OK, 50 percent in violation; 24 MPH 90 percent OK, 10 percent in violation). In the cases of absolute and fuzzy limits, there is an implicit assumption that "doing well" is clearly defined. In many cases, "doing well" is not fully understood within the full context of the operation. As a result, conditional limits or self-adjusting statistical limits can be used with some success. Continuing benchmarking against personal or project best and establishing that as the only acceptable level of performance (or a narrow limit below it, say 5 percent) is often used in sales organizations. A more sophisticated method is to maintain performance within two statistical standard deviations of the average performance recorded over multiple periods. Other variants are possible, and each brings its own set of management implications. Once again, students are cautioned to keep the control limits in consonance with the strategy and approach to project control. If PBC requires only insight, then the project plan team may be well outside its control boundaries in prescribing complex control limits for dimensionality criteria or contractor management processes.

Slide #6-21

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS

SPECIFYING DATA NEEDS

Metrics are composed of raw, unprocessed material called data. In most cases, data (numbers) are not equivalent to information; data must be translated, related, and displayed in a manner that allows interpretation. Data requirements call for careful up-front assessment. The source of data, quantity, quality, periodicity, and format are important considerations because they all drive cost. As stated previously, although many things can be measured, not all things that can be measured are profitable. Once a data item is determined to be needed, it should still be balanced with practicalities of cost and the benefit gained from that particular bit of data. If the contractor is unable or unwilling to offer a specific element of data (proprietary or sensitive to his operations), then the PSP team should consider a trade-off between project need and the cost of the Government performing data collection and possible data alternatives.

Traditional approaches to data collection are being supplanted by new practices. In the past, a contract may have specified a data requirement using a "canned" list of standard data items and the corresponding Agency-standard data item description. The streamlined acquisition processes and revocation of standardized specifications have made it necessary to be more specific in requests for data from the contractor. It is not safe to assume that the project management information system of the contractor is open to the Government without specific negotiations and exchange of consideration. The data held in that information system is a vital part of maintaining competitive advantage and will be guarded jealousy, particularly when sensitive performance results are included. As a result, it is probable that data may become as dear in cost as the hardware items themselves. In some cases, the Government may be required to collect data on its own, particularly if the contractor has demonstrated to itself that the requested information provides little or no value to its operation.

Slide #6-22

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SPECIFYING DATA NEEDS The following rules of thumb should be considered: • **Specific low-level data must be processed to obtain useful information. They are the most "noisy," most sensitive, and most subject to internal variation.** • **Enumerated information (number of outstanding ECPs, number of items delivered, number of persons employed) is inexpensive until it is requested to be characterized and sorted.** • **Contractor-provided efficiency data are frequently misleading because they often provide incomplete or unclear accounting of the true costs of the produced element.** • **The more complex the data requirement, the more expensive it is to gather and process the data for use.** • **No data are ever "free." Someone must gather, collate, and package the data for use and that activity must be paid for.**	Slide #6-22 (concluded)
PRESENTATION OF METRIC INFORMATION *Instructor note:* **use the auxiliary set of slides of "real" metrics to critique, improve, and illustrate your points. Focus on clarity of information, story being told, and what message is being communicated to the decisionmaker.** **Metrics become useful in program management when they tell a story in clear and unambiguous terms. When you go to buy laundry detergent, those that sell best are those that communicate in clear terms the benefits that you gain/problems you solve- not the materials used to make the soap. Too often**	Slide #6-23

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

PRESENTATION OF METRIC INFORMATION
 	
the metrics displays we use don't clearly show the problem or show how the problems are being fixed (or need attention now). Legends and axis labels must be clear, colors must be pleasantly high contrast, and a central message provided. Like a picture, focus the user's attention to the center of the display.   Provide necessary information by telegraphing the message - use text boxes and arrows to draw attention to good and bad news. DON'T ever try to hide bad news!! When the bad news is found out and the lack of reporting integrity revealed, all credibility is lost.
        Find ways to show the relative importance of issues that contain bad news. Metrics are meant to help decision-makers find problems, assess the impact of the problem, and create solutions. Use of criticality codes, risk ratings, and dollar impact scales all help to interpret the real meaning of the news. Whenever possible, show good and bad news interspersed, but tell a story: summarize frequently, explain the impact often, and provide a road map to the information. On the display, always let the user see the established control limits or benchmark goals.
        Fitting the metric display to the information/data is critical. Understand the nature of the data prior to displaying it. Time-series data should consider only the relevant time scale. If data from two years back is not relevant to today's decision, then do not display it. Show trend lines that reflect the dynamics of the process (nothing longer than six months for most metrics, preferably three months).   When several factors are working together to create an output, show a response surface with the factors on the X and Y axes and the response on the Z axis.   Use three-dimensional drawings only when the issue is 3-D (two inputs, one response). If there is ever any doubt about the meaning of the information on the graph, use a message box to interpret it.
	Slide #6-23 (continued)

	Course Number:
DETAILED OUTLINE OF INSTRUCTION FOR LESSON 6: ESTABLISHING PERFORMANCE METRICS FOR PROJECT SURVEILLANCE	**Module: 6**
INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
PRESENTATION OF METRIC INFORMATION When working with comparative metrics, look for percentages or rates to tell the story (error rates, resolution rates). When absolute value of a process output is critical, use it, but in most cases look to use output per unit input. Because critical path charts and schedules are difficult to interpret, do not use them as management displays. If a project is ahead of schedule in 8 of 10 critical path activities, state that fact (and specify how much ahead). If there are problems in the schedule, illustrate the problem; show its worst case impact and tell what is being done to correct the problem and mitigate the effects. Computer technology has made it very easy to create good metric displays as well as extremely poor displays. The key to creating good displays is understanding what the data expresses in terms of the underlying process and the contractor's performance. If the performance is important to the project, then it should be shown - good or bad. A well-drawn hand-rendered chart that accurately portrays a critical issue and provides essential decision-maker information is far better than a four-color graphic in 3-D that shows a problem that happened three months ago and has already been overcome by events. Use creativity and imagination to tell a story.	Slide #6-23 (concluded)
ESTABLISHING THE MANAGEMENT CONTROL PROCESS This lesson has thus far covered the qualities of good metrics, the notion of control limits, and graphic displays of metrics. This concluding section concerns the really difficult decisions (i.e., what happens when contractor performance does not meet requirements or results in products that do not perform properly?)	Slide #6-24

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
ESTABLISHING THE MANAGEMENT CONTROL PROCESS The management control process is an outgrowth of the metrics development process. If the response to contractor performance "non-conformance" is defined in the PSP, then less opportunity will exist for the contractor to slip through the net of accountability. The Agency and project organization will have a neatly compiled book of "if-then" situations to correspond to each metric in concert with the execution strategy. By developing these responses in advance, the project team is provided a single guide book for nearly all "important" events. Objective metric data are indeed a powerful lever to assess performance and anticipate future performance. The development of management control responses in advance removes the variability of response when multiple, non-conforming events occur at differing ends of the project.	**Slide #6-24 (concluded)**
ESTABLISHING THE MANAGEMENT CONTROL PROCESS (CONCLUDED) The development of a clearly articulated management response process in the PSP can send an unmistakable message to the project organization and the contractor concerning expected performance. A change in project management has less chance of changing the responses once they are in place and agreed upon. The PSP thus provides a means to ensure all project team members are on the same wavelength for management. Integrating management control responses with the communications and assurance activities provides an opportunity for formal feedback to the contractor and project management staff on the effectiveness of their project in achieving tangible outcomes.	**Slide #6-25**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
MANAGEMENT RESPONSE TO NON-CONFORMANCE In simple terms, this response is the set of written rules that describe what the Government will do if measured performance fails to meet standards. Many differing types of graduated response approaches are available: complementary (reinforcing) response, corrective (problem-solving) response, and disciplinary (punitive or withholding) response. Each of these should be tailored to the situation based on the nature of the team and the project. Hard and fast rules, although attractive when tied to objective performance metrics, may have a downside, requiring extensive administrative review and appeal processes (particularly on punitive responses). They may also be subject to challenge, particularly if the information being used is generated by the Government.	Slide #6-26
SUMMARY This lesson has demonstrated that metrics are absolutely essential to creating the insights needed to perform performance-based contracting. The collection of focused information, displayed and interpreted in a non-invasive manner, provides a means to achieve the gains envisioned by the Agency in its downsizing. Objective information, generated by a mixture of contractor activities and independent Government activities, provides the basis for incentive award, for corrective management action, and for effective project management. In most cases, fewer high-quality metrics are better than an abundance of marginal measures. Metrics are anything but static. Some metrics related to project "health" will continue throughout the entire project, while others may be appropriate to only one segment of the project. The PSP team should consider this in its selection and specification of metrics.	Slide #6-27

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SUMMARY

 This process of metrics selection takes work, careful planning, and solid integration into the overall management approach. In some cases, description of management response to control limit non-conformance can establish the framework for the dynamics of the evolving management process. The prime value comes from establishing a framework for performance measurement and a structure for dealing with management issues in a proactive manner.

Slide #6-27 (concluded)

OVERVIEW OF NEXT LESSON

 In the next lesson, each of the teams will create a suite of core metrics needed for management control of the sample problem. Each team will work with a set of worksheets to define the metric and all supporting information and will then present their plan to their peers for review.

Slide #6-28

DETAILED OUTLINE OF INSTRUCTION FOR LESSON 7: LABORATORY: ESTABLISHING PERFORMANCE METRICS FOR PROJECT SURVEILLANCE	Course Number:
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ESTABLISHING PERFORMANCE METRICS FOR PROJECT SURVEILLANCE
 	
   This instructor's guide provides the student teams with an introduction to the workshop and its format. The actual format of the workshop will depend intrinsically on the tasking for instruction provided by the sponsoring organization.
 	
   This laboratory is designed for small group interaction in the development of metric systems for use in performance surveillance and overall project management. The development of metric systems (composed of data, analysis, display, control limits, and response) enables the essential practices of Performance-based Contracting (PBC) including non-intrusion into contractor processes, fee based on performance, and substantial performance insight. The laboratory reflects a Socratic approach of structured questions that allow the group to reach consensus in determining their specific course of action. Worksheets and background problem sheets are provided with this package to facilitate discussion, structure outcomes, and provide records of decisions reached in the group. In addition, each class member has a copy of a sample Program Surveillance Plan (PSP) for the fictitious IO3 project for use as a reference. Student teams must maintain a close awareness of their prior efforts in defining strategy and activities to maintain a high level of outcome congruence with the metric development task.
 	
   In some cases, the instructor may be guiding a group that is actually developing a Project Surveillance Plan. In that case, a worksheet for project information gathering should be used. Our recommendation is to forward this worksheet to group members ten days before the workshop for completion and use in developing major sections of the group's PSP. The focus in this situation will be on assuring that the data systems (collection, processing, and analysis) are achievable within the resource constraints and that the elements collected have utility for use in risk management.
	Slide # 7-1

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
ESTABLISHING PERFORMANCE METRICS FOR PROJECT SURVEILLANCE Although the recommended work group size is five people, up to eight persons may be assigned to a group. Whenever possible, create and use multi-disciplinary teams composed of engineering, procurement, quality, and project management specialists for these exercises. Groups require separate breakout areas to complete their exercises prior to returning to the main meeting room. This laboratory module requires approximately 2.5 hours to complete. This module provides student teams with the experience of application of the concepts of performance monitoring through the identification and formation of process and outcome metrics. In this laboratory, student teams develop a suite of performance metrics that are intended to provide sufficient insights into the effectiveness of the contractor organization in achieving NASA's desired outcomes. The metric development exercise builds on the strategies and activities developed in the prior laboratory. However, the metrics development process is more than just identification of desired data and its display. It also incorporates the establishment of control limits (limits of conformance) and management rules for non-conformance. Student teams will be tasked to develop metrics, displays, control limits, and non-conformance rules for a sample problem or for one that they face in their organization.	Slide # 7-1 (Concluded)

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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
LEARNING OBJECTIVES Specific learning objectives are shown on the slide. The most important outcome is gaining experience in formulating metrics in a critical crucible of peer pressure. Information collection, data processing, and related management control action add a cost to the project. Students must learn how to constrain their data demands, to structure high information content displays, to identify performance insight and predictive metrics, and to define metric control limits and management response *a priori.* Use of the toolset of worksheets helps to structure the learning process, but nevertheless relies on student interaction to obtain effective metrics.	**Slide # 7-2**
REVIEW OF PAST LESSON (Optional slide) In the past lesson, students gained an appreciation for metrics, their use in project management, and their utility in accomplishing the objectives of performance-based contracting. The instructor may wish to review some of the basic concepts related to this laboratory. Assure that students go in to the exercise with the basic question, "Does it add value?" on their lips. If a proposed metric adds limited value, then it should be screened for exclusion. Under PBC, there is no room for "nice to have." Collection and analysis of data to form informative insights require time, resources, and brain power. Clutter makes it difficult to view the truly important bits of information leading to "ahah" insight. This exercise should provide participants with personal insights on establishing and maintaining the proper type and flow of information.	**Slide # 7-3**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

STUDENT TEAM LABORATORY TASKING
 	
    Each team will have approximately two hours and ten minutes to complete this exercise. Introduce the student worksheets to the teams. Explain that by fully completing a set of three worksheets for each metric, all five tasks will be completed.
 	
    Recommended task completion sequence includes the following:
 	
• Functional Area Experts (sub-teams) identify needed metrics (name and brief description)
• Team re-assembles and group-wise sorts through metrics (consensus)
• Team facilitator makes detailed definition assignments to sub-teams (analysis, display, control limits, and management's non-conformance rules)
• Team prepares for presentation of key insight metrics to large group
	Slide # 7-4

TEAM PRESENTATIONS AND CRITIQUE
 	
    Conduct a seminar debrief. Select two groups to present their key insight metrics set using this slide as a guide. Guide the critique towards positive elements of the metrics and identify opportunities for improvement. Assure teams identify control limits. Have the team describe their approach to maintaining congruence with the prior activities and strategy session.
 	
    Be brutal on the display of information. If time is available, display some really terrible metrics and show how they can be downright misleading and crammed with noise. Focus on how to improve the displays.
	Slide # 7-5

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
PREVIEW OF NEXT SESSION This slide identifies the major topics for the next lecture session. Inform the students that organizational conflict and resource problems can cause more problems to project execution than any other element. Intergroup, interagency, and interpersonal bickering due to poorly defined tasking and unenforced accountability can destroy project cohesiveness and establish conditions that distract the staff from their primary responsibility – assuring successful project performance. Additionally, a lack of the needed resources will lead to individual dissatisfaction as well as intense competition for resources within the project organization. Adequate resourcing, based on the scope of activities and metrics detemination, prevents many shortfalls in NASA monitoring performance.	Slide # 7-6

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CREATING THE PROJECT SURVEILLANCE ORGANIZATION This slide introduces the last major section of the PSP and this workshop: the complex issue of creating a project surveillance organization. This issue, more than probably any other issue, drives the absolute effectiveness of the Project Surveillance Plan. All the strategies, activities, and metrics will not make a difference without a staff of dedicated people, organized in a way that allows them to execute the PSP. This module addresses the realities of bringing people and resources together into an effective organization. People perform surveillance, process information, and proactively manage the contracted effort. Tools are provided to help the PSP team estimate the personnel requirements for performing insight surveillance for program management.	**Slide #8-1**
LESSON OVERVIEW This lesson begins with two quotes appropriate to the task of building the organization to execute this plan. As the executing organization is built, countless disagreements will occur, but in the end, a workable organization will be created that can effectively operate within the NASA and supporting agency constraints while assuring that objectives are accomplished. Timidity, business as usual, and plodding bureaucracy are no longer the rules of the day.	**Slide #8-2**

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LEARNING OBJECTIVES The intent of this lesson is to provide necessary refresher skills in the art and science of organizations to the student. The lesson provides the opportunity for the student to review several alternative organizational structures that are commonly used in project management and contrast their advantages and disadvantages for specific types of projects. In addition, the student will be introduced to a division of responsibilities for the project organization that provides the opportunity for coherent execution of a common plan. Upon completion of the lesson, the student will also have at his/her disposal a set of "rules of thumb" that can be used to estimate surveillance staff requirements.	**Slide #8-3**
OVERVIEW - ORGANIZING FOR INSIGHT SURVEILLANCE The topics discussed in this lesson assume that the student has a basic knowledge of organization theory and has previously been introduced to the concepts of a "quality" organization. The lesson begins by reviewing some maxims of organizational thought that are being proven to be effective in developing "world class" operations across a wide range of industries, functional areas, and non-profit organizations. As the question of staffing the organization is explored, the student will understand the contrasts between organic teams, synthetic teams, and floating teams and decide which is most effective for particular job environments. The use of in-Government personnel or contractor resources can be a ready and relatively painless way to augment project staff for a short-term basis. However, some longer term project staff functions may require continuous augmentation.	**Slide #8-4**

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OVERVIEW - ORGANIZING FOR INSIGHT SURVEILLANCE Based on these functional needs, the lesson continues by providing estimation techniques for sizing the organization. Recalling that one of the major themes of PBC calls for increased accountability by all participants, this final section discusses the potential positional roles and responsibilities. Although this may seem much like a traditional job description exercise, it is more focused on the responsibilities each person assumes and how they will make themselves accountable to the group for continuing successful past performance.	Slide #8-4 (concluded)
USING ORGANIZATIONAL CONCEPTS THAT LEAD TO SUCCESS Teams should be used relentlessly to accomplish project objectives. The best minds of current times continue to observe the power of teams in accomplishing major tasks in record time and with spectacular results. Teams appear to have a special vigor associated with a single-task orientation and dynamic interplay of the individuals of the team (synergy). Most practitioners advocate the use of small multi-functional teams in which a mix of functional specialists are assembled to tackle an interdisciplinary problem. Team members are committed to the project for a set period of time and rotated to other teams to work other projects. It is management's function to provide the definition of the task, then empower the team to work it, and respond to findings of the team. The job in this new work world it to gain insights to assure that the Agency receives the product for which it contracted. There are not enough resources for the older "empire building" model of success.	Slide #8-5

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USING ORGANIZATIONAL CONCEPTS THAT LEAD TO SUCCESS Flat project organizations with low or no hierarchical structures seem to work best. "Running it up the chain" is a surefire killer of creativity and useful insights. Rather using this method of approval, the "upper manager" should be linked into the project team for a set period of time to provide insights and experience and to make him or her a co-owner of the team's product. When the concept eventually goes to final review, champions will already be in place to assure its success. The teams should include representatives from every group that has a vested interest or that can say "no" to the project. Mixing insiders and outsiders, including the contractor, provides a balance to "Agency-centric" thinking. Outsiders may provide insights into methods that have worked elsewhere that may work for NASA. Avoid the immediate rejection of ideas that were "not invented here." The tasking manager has a difficult job in explaining what he or she wants the team to accomplish without biasing the way that the team approaches the problem. The team's performance will in large part be shaped by the expectations of the tasking party; success or failure depends greatly on the way the task is defined and what the rewards are for success. Motivation in the form of "you get to keep your job" and "everyone else has failed" seldom results in positive results. Similarly, the manager must communicate clear expectations: when the team will provide progress updates, what specific outcomes are needed (reduction in per item cost, 10 percent improvement in thrust output, 15 percent fewer parts in the assembly), and length of time allocated to the team.	Slide #8-5 (continued)

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
USING ORGANIZATIONAL CONCEPTS THAT LEAD TO SUCCESS Team members must also communicate early in the process to define resources that are needed and to request that key leaders are made available. Realistic estimates based on past experience and known future expectations provide a basis of credibility and integrity for future projects. When the team is chartered with funding, equipment, and a space to define as theirs, true empowerment can be achieved. Although not frequently acknowledged, teams also need a space to call their own that can be tailored to meet their unique needs. Features identified with team workspaces include wall space for butcher paper and brainstorming charts; open flexible spaces with easily movable furniture for ad hoc meetings; personal closed space for quiet introspection and inspirations; decor in colors that inspire creativity and productivity; and easy access to all team members. As the team identifies itself, the project space takes on the identity of the members. Team life provides the opportunity for creativity and invention; the workspace should never stand in its way. The surveillance team should have the clear ability to share in the spoils of victory. If in working with the contractor and the Government, the team's new ideas result in substantive cost avoidance or greatly improve effectiveness or efficiency, then the savings should be shared directly with the entire team. To encourage team behavior, team success, not individual success, should be rewarded. As a result, the team receives well-earned recognition, and the individual receives recognition in the context of a team. Attilla the Hun and Sun Tsu recognized this principal in their campaigns and obtained unwavering dedication from their teams.	Slide #8-5 (concluded)

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
STAFFING THE INSIGHT ORGANIZATION There is absolutely no substitute for talent when staffing the organization. Many successful firms preach the mantra of "hire for attitude and raw talent; we'll train them once they are in the door." The organization must always find ways to improve its acquired knowledge base, to exploit it in their every day work, and to continuously evaluate performance for ways to improve it. When hiring people, managers should look for the presence of excellent interpersonal skills, a humorous yet positive outlook on life, the consideration of team, the desire to make a difference, and the ability to develop a winning solution for all parties. In addition, managers should seek people who like to solve problems: they will find the solutions and put them in place. If needed, personnel can be matrixed out to other staffs or geographical areas to allow (even short-term) participation of top performers. Their way of thinking and insights can inspire the entire team to achievements that might not have been realized previously. In addition, the staffing leader must make the opportunity to participate on the team an attractive one to these top performers. Intangible incentives such as fun, exciting work, autonomy, rewards for performance, ability to try new ideas, interesting work spaces, and even pizza can be strong enticements when comparing work in more conventional environments.	Slide #8-6

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
SIZING THE ORGANIZATION AND ESTIMATING RESOURCES Sizing the insight organization is a direct function of the nature of the project, the surveillance strategy being pursued, the surveillance activities planned, and the experience of the team selected. The surveillance strategy concerning the mix of oversight-insight in conducting surveillance should be used as a guideline. More people will be needed for oversight than insight (factor of at least 1.8:1). The activities that have been identified should be examined closely. Are they regular recurring activities? If so, full-time equivalents will be needed. How much time and how many people will each activity require (including time for report write ups and data entry into the metric data bases)? If the activity is a one-time or infrequent occurrence, but a critical activity, using OGA, matrix, or contractor resources to augment full time staff should be considered.	Slide #8-7

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
DECIDING ON MATRIX SUPPORT OR PROJECT STAFF FOR CONTINUING SURVEILLANCE ACTIVITIES The PSP-project team has multiple considerations when identifying the surveillance team organization and participation. Fundamentally, the project team has the ability to be structured as a dedicated project staff whose prime function is to support the needs of the project. Its structure will reflect the availability of resources, the needs of the Project Manager, and the type of project being monitored. The most common structure found in small project offices is that of a small core group of dedicated project management specialists (5 to 10) and large numbers of matrixed-in support specialists. In some cases, some of the support specialists will become permanently attached to the project team, although they remain supervised within their functional specialty. (Quality Assurance is one example of this.) Nevertheless, the PSP team will assign project responsibility to those involved, and they will be responsible to the Project Manager for delivery of needed services. The matrix support concept provides a "pay as you go - use only what you need" opportunity for a lower cost than a full-time staff. However, this just-in-time concept may have some downsides with respect to availability of individual experts and embedded loyalty to functional line rather project. The full-time staff element, which includes the project experts, provides the essential stability needed for recurring project management tasks. However, the "project-centric" focus may require them to always be looking for a new project as one nears its completion. In addition, full-time people must be paid for all of their time.	Slide #8-8

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CHOOSING GOVERNMENT AGENCY OR SUPPORT CONTRACTOR FOR SPECIALIZED SURVEILLANCE ACTIVITIES Project management will also need to consider "outside" organizations for specialized functions that are not normally within the NASA organization. Government agencies, such as DOD, DOE, CIA, and NOAA, are frequently participants in cooperative programs with NASA. These organizations require a strong project presence throughout the life of the project, if for no other reason than to assure that their specific needs are being properly translated and that their interests are properly represented. In other cases, special skills and facilities may be introduced into the project organization through the use of outside Government agencies. These organizations frequently provide high-quality services at a reasonable cost to the project and without the complications seen when obtaining contractor support. However, their resources may not always be available and their people answer to another chain of command outside the project organization. Commercial support services contractors are in many ways like a dedicated project team, but like other outsiders, they require funding to keep running. The staffs are frequently among the best to be found and come whenever they are summoned. However, these experts cannot always act independently to accomplish problem resolution without explicit authorization of the Government. Of course, their activities will also require monitoring under the PBC concept.	Slide #8-9

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
SIZING THE INSIGHT ORGANIZATION AND ESTIMATING RESOURCES (CONTINUED) As noted previously, specific subject matter experts can be brought in on an "as required" basis and may be the most economical option. Use of specialists from any matrix, OGA, or contractor support source is fairly easy to estimate. As a rule of thumb, for any activity needing external support, double the number of project support specialists staff for the duration of the activity to derive a person workday requirement. Adjust as needed to compensate for known requirements for particularly heavy or light loading for the activity. For major project reviews, plan on doubling the entire permanent project staff for the duration of the activity (remember to add a day on either end for travel). From this, derive the person workday requirement and include in the personnel budgets.	Slide #8-10

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
SIZING THE INSIGHT ORGANIZATION AND ESTIMATING RESOURCES (CONTINUED)	Slide #8-11

SIZING THE INSIGHT ORGANIZATION AND ESTIMATING RESOURCES (CONTINUED)

External Government support (DCMC) is commonly used for hardware verification. When establishing the relationship, make it formal. Describe what is expected, when, where, and what quality standards will be used in NASA assurance activities that will be used to monitor their performance. Assume nothing will be done unless it is specifically described. The OGA should do its own sizing. Since these individuals are from other agencies, they may have special regulations or guidelines that may increase the cost to NASA when performing resource estimation. Recall that Full Cost Accounting will become a factor as it is phased in to the Government.

Some simple rules of thumb can be used to estimate the overall staffing levels for a project.

Assume that each major project ($100 M or greater) will have a dedicated Project Manager, Deputy Project Manager, and an administrative support member. Additional support specialists and administrative support will be added as needed.

Support Specialists (QA, Engineering, Mission Specialists, Logistics, Contracting, etc.) are project staff permanently attached as part of the project team with a technical or project orientation. Any of these rules can be used for a predominantly insight-managed program (using FFP or Cost plus contracts) for all specialties put together:

- 1 staff labor hour for 20 direct contractor labor hours or
- 1 FTE (full time equivalent) for 32,000 direct contractor labor hours

Plus Administrative support: plan on 1 FTE per 7 FTE support specialists.

Remember to annualize the hours to get an annual requirement for the staff. Adjust as needed (usually upward when using an issue-resolution strategy).

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
DEFINING PROJECT SURVEILLANCE ROLES AND RESPONSIBILITIES The surveillance plan must contain the contractor's expected role and responsibilities in the Government's surveillance of the contract. Most of the preceding discussion has clearly focused on what the Government will do for the contractor. Focus now shifts to what the contractor will provide, in addition to the primary product to support the surveillance task. The PSP surveillance organization section must be clear on what it expects the contractor to produce in support of the surveillance task. Data, access, communications, and certain internal assurance and surveillance processes are samples of what can be expected. In addition, it will be instructive to begin to scope out the probable lines of communication between the contractor and Government POC for essential processes. The information and communication activity expected from each person in the contractor's organization should be identified and included in negotiations as well as the final contract. Many of the tasks may be program life-cycle sensitive, requiring differing levels of involvement in each segment.	Slide #8-12

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
DEFINING PROJECT SURVEILLANCE ROLES AND RESPONSIBILITIES (CONTINUED) This slide and the next provide one vision of the types of roles for which each NASA project staff member could be expected to be responsible. Again, the PSP team and PM will have the final say on who does what. The concept of an inside-outside person (PM and DPM) may not be valid for every project, but it may become more important as individual projects become more politicized and require greater "selling" within candidate constituencies. The lead engineer is the project head technical staff member with the final say on performance and technical issues. This person should supervise contracted technical analysis, OGA technical analysis and test, and other critical technical elements related to technical performance and adequacy of insight.	**Slide #8-13**
DEFINING PROJECT SURVEILLANCE ROLES AND RESPONSIBILITIES (CONTINUED) Other typical project staff members are identified on this slide with representative roles and responsibilities. As a recommendation, the Project Manager may be well served by taking time with each project member, or the group as a whole, to make certain each person understands their responsibilities, performance standards, and accountability to the job. This assignment does not need to be written, but it does need to be clearly communicated within the context of the group. Lead and follower/backups should be assigned. Whenever possible, avoid being one-person deep in any critical surveillance area (good job for the DPM). When tasks are not being completed, track down the reason for the delay. Make certain that understanding of assigned responsibility is followed by accountability.	**Slide #8-14**

DETAILED OUTLINE OF INSTRUCTION FOR LESSON 8: CREATING THE PROJECT SURVEILLANCE ORGANIZATION	Course Number:
	Module: 8
INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
DEFINING PROJECT SURVEILLANCE ROLES AND RESPONSIBILITIES (CONCLUDED)	Slide #8-15

DEFINING PROJECT SURVEILLANCE ROLES AND RESPONSIBILITIES (CONCLUDED)

The PSP is the prime planning document to describe what is expected of the various external (to the project team) NASA offices and the OGAs supporting the project. Key recurring responsibilities should be summarized, specific activities should be assigned, and responsibility for performance should be designated to the project staff. The outside groups each should sign a "contract" such as a Memorandum of Understanding/Agreement with the NASA Project Manager to preclude significant misunderstandings and missed opportunities.

Roles and responsibilities expected by Headquarters and Center organizations should also be articulated and a POC within the project appointed to work specific issues. Try to keep upper-level "oversight" limited by offering to provide insight metrics for their use in a format appropriate to their needs.

In short, time spent articulating the various roles and missions initially will provide a starting point that will invariably change during the project life cycle. The key point is that time spent planning for the staffs, resources, and support will help to offset the euphoria anticipated in PBC contracting and provide more realistic expectations. PBC and insight surveillance require a higher initial cost than any other form of contract. Performed correctly, however, they offer opportunities for execution savings.

DETAILED OUTLINE OF INSTRUCTION FOR LESSON 8: CREATING THE PROJECT SURVEILLANCE ORGANIZATION	Course Number:
	Module: 8
INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
SUMMARY Initial organizational tailoring offers advantages due to the thought process and insights gained in structuring a new and still unknown organization in the NASA work process. As needs change, so can the organization. The PSP and PBC offer opportunities for new and innovative processes using new open team structures with diverse contributors. However, the use of a team in a constrained environment indicates that all team members must be ready to do their jobs and those of their neighbors if the workload demands it. Sizing of the project surveillance organization ultimately relies on available resources; a first cut of this plan is a necessary precursor to development of more detailed budgets.	Slide #8-16
OVERVIEW OF NEXT LESSON After the break, student teams will assemble to develop their specific organizations. This chart shows the specific activities they will undertake.	Slide #8-17

	Course Number:
DETAILED OUTLINE OF INSTRUCTION FOR LESSON 9: STUDENT LABORATORY CREATING THE PROJECT SURVEILLANCE ORGANIZATION	Module: 9
INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
CREATING THE PROJECT SURVEILLANCE ORGANIZATION This instructor's guide provides background information for the instructor to introduce the student teams to the workshop tasking and the team's expected results. The structure and content of the workshop will depend intrinsically on the tasking provided by the sponsoring organization and the expected outcomes of the individual groups. This laboratory is designed for small group interaction in the development of the organization, its taskings and responsibilities, and required resources to conduct performance surveillance and overall project management. The development of management systems (composed of intrinsic and extrinsic organizations, operating procedures, and group dynamics) defines the interpersonal and organizational elements required to execute Performance-based Contracting (PBC). As in prior laboratories, the Socratic approach of student teams responding to structured questions leads to project-focused team structures, assignments, and resource allocations. Worksheets and background problem sheets are provided with this package to facilitate discussion, structure outcomes, and provide records of decisions reached in the group. In addition, each class member has a copy of a sample Program Surveillance Plan (PSP) for the fictitious IO3 project for use as a reference. In addition, student teams must maintain a close awareness of their prior efforts in defining strategy and activities and developing insight metrics to maintain a high level of project integrity. The focus of the workshop is assuring that the desired/required project support needs are defined, that organizational coordination processes are initiated, and that resources required to execute project surveillance are identified.	Slide #9-1

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DETAILED OUTLINE OF INSTRUCTION FOR LESSON 9: STUDENT LABORATORY CREATING THE PROJECT SURVEILLANCE ORGANIZATION	**Module: 9**
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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
In this session, the teams will define the project surveillance organization, assign responsibilities, and establish accountability chains. In addition, teams will make a first cut on project resource requirements. This section builds on the strategy, activities, and metrics sessions previously completed. Emphasis should be placed on making certain that the surveillance organization is "right-sized" to support the task of insight surveillance. The tendency will be to stick with paradigms of the past when the functional needs of the present dictate an alternate structure. Also, assure that the teams pay close attention to their resource requirements. Although some synergism may be obtained through DCMC verification activities, activity-based accounting will require complete project accountability for all direct support. As before, the recommended work group size is five people; however, up to eight persons may be assigned to a group. Whenever possible, create and use multi-disciplinary teams composed of engineering, procurement, quality, and project management specialists for these exercises. Groups require separate breakout areas to complete their exercises prior to returning to the main meeting room. This laboratory module requires approximately 1.75 hours to complete.	Slide #9-1 (concluded)

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INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
LEARNING OBJECTIVE The student teams will complete the final major sections of a draft Project Surveillance Plan in the laboratory by defining details of the surveillance team and estimating the life-cycle resources for surveillance activities using an activity-based costing structure. At the completion of the laboratory, two teams will be selected by the instructor to present their outcomes for review and peer critique. Present the student worksheets and review their potential use to the teams. (They are intended to guide identification of the project organization in context of the center/HQ/OGA/contractor groups that will be participating; develop the organic direct project staff responsibilities; and create annual and life-cycle cost estimates.) Point out that use of the sheets is optional; however, using them will help to assure that the team meets the tasked objectives.	**Slide #9-2**
REVIEW OF KEY CONCEPTS Use this slide to stimulate project team preparation. Remind the teams of the proven utility of matrixed staffs, the need to establish rigorous lines of accountability for staff performance, and the absolute requirement to provide adequate resources from the very beginning.	**Slide #9-3**
REVIEW OF STUDENT PLANS Although this step is optional, it can illustrate the concepts of benchmarking and borrowing good ideas. Each team should take a few moments to review the top-level strategy to reset their focus. Teams should also review their list of activities and estimate the resource requirements for each (by year). Similarly, if the metric is internally generated, then its generation must be planned and resourced within the organization. If the team has planned to use a potential non-standard metric, NASA may have to pay the contractor extra for it or engage in negotiations to obtain it.	**Slide #9-4**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
STUDENT TEAM LABORATORY TASKING Task the teams to develop their recommended surveillance team structure and operations paradigm, connecting strategy and activity areas to staff allocations. The staff resource estimation step is intended to demonstrate that the expense of project surveillance can be substantial, particularly when considering no-value-added, mandated requirements. (This estimate is a solid initial point for estimating project "cost of quality.") Break into teams to complete this tasking prior to returning to the seminar group.	Slide #9-5
TEAM PRESENTATIONS AND PEER CRITIQUE Select two previously un-selected groups to provide their insights into organization structure, participants, and functional assignments. Allow for positive, contributory remarks that would strengthen the project organization or include other elements that may be statutory requirements. Complete by identifying unique approaches that should be noted by all teams for use in future PSPs. Survey all the groups to estimate their projected first and second year staff sizes/requirements. Post them on a board for all to see. Note any extreme variances (high or low) and inquire about the source of the variance. After emphasizing the excellence of the work of all teams, conclude the module with dismissal for a 15-minute break.	Slide #9-6

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
WORKSHOP RECAP This slide introduces the last lesson of the PSP workshop. This session recaps the important issues and driving forces that mandate a change in the way that NASA will do business in the future. It summarizes the lessons learned, the processes used, and insights shared in developing a Program Surveillance Plan. It reminds the student how the structure and process of creating a PSP is a flexible tool that complements the PBC initiatives and allows the Agency to meet the future challenges in an efficient and effective manner. This session provides a challenge to make this process work better through personal dedication to its use and internalization. It provides the creators of the process insights into how to make this instruction more effective in meeting a wide range of users needs.	**Slide #10-1**
CHANGE AND LEADERSHIP ARE MUTUALLY SUPPORTING This workshop has been everything but simple. It has challenged embedded paradigms of operations and forced creativity from individuals that will make the difference in NASA's future. It promotes change in ways that right now seem quite risky, considering the nature of large organizations. However, change is the rule of the day. PBC initiatives, single process initiatives, advanced quality systems, metrics, and total quality management initiatives, all coupled with continuing organizational and functional shifts, make the whole work environment rather uncertain. As soon as one seems to know all the rules, they change. Individually and collectively, however, change is mandated. Leading the change provides an opportunity to rewrite many of the rules and define the way that business will be done in the near future. Rather than responding to volumes of rules, individuals on the leading edge can select among many paths and decide their own destiny. Leadership in this environment requires that individuals have equipped themselves with the right tools: knowledge, experience, courage, and a willing attitude.	**Slide #10-2**

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INSTRUCTOR NOTES	TRAINING MATERIALS AND SUGGESTIONS
WORKSHOP RECAPPED (CONCLUDED)	**Slide #10-2**

WORKSHOP RECAPPED (CONCLUDED)

Knowledge comes from studying what the leaders are saying, writing, and demonstrating and from internalizing their lessons. There are volumes of information by forward thinkers that NASA wants individuals to read and absorb. The lessons are not all in exactly the same words, but they are of a common thread. The ability to sift through, identify key thoughts, synthesize, and articulate this information into a way of doing business is an essential skill. Experience tempers the abstractions of theory with insights into what can work and how to go about getting to the objective. It provides insights into people, organizations, and dynamics and where to go to get questions answered.

The personal attributes of willing attitude to tackle change and courage of conviction to do what is right, to follow Covey's *Seven Habits of Highly Successful People* to reach truly interdependent lifestyles, will make a crucial difference. This distinguishes leaders from followers and defines individual ability to controlling one's own destiny.

The workshop has provided each individual with an opportunity - the knowledge of PSP and PBC and the hands-on experience of creating a PSP were here for the student's use. The question now is how will each person here use it?

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**

PBC-PSP SUMMARY

Slide #10-3

The review discussed that PBC has a strong and continuing endorsement from the highest levels and is being instituted across the Agency. The GPRC initiative and continuing Congressional, executive, and popular pressure on Government to do things more efficiently will continue unabated. The aging of the boomers will begin to place serious constraints on non-entitlement programs as the first of the wave begins to retire shortly after the end of the century. NASA no longer has the luxury of hiring legions of the best and the brightest without a commensurate high level of productivity in meeting national goals.

PBC requires less Government intrusion into the contractor's processes and production lines. PBC focuses on assuring that NASA receives the products and services for which the Agency contracted. Pay is for performance, not good intentions. However, the Agency cannot totally remove itself from the process and should retain insight into the contractor's progress. The Project Surveillance Plan is used to plan the activities, metrics, and organization that will be used to monitor contractor performance.

PBC implementation is a team effort that requires a total solution. It starts with a clear statement of need in the form of requirements that state what the desired outcome is rather than how to meet the requirement. The contract statement of work focuses on outcomes and performance objectives. Contract structures must be selected that provide cost-effective alternatives to traditional fee evaluation processes. Contracts must worked using non-traditional methods that increase the payback for contractor risk assumption while assuring product performance. Guarantees of exclusive use of NASA technologies, inventions, and other patent-protected properties can induce contractors to develop "best of class" solutions with the promise of guaranteed protection in the marketplace. The development of a PSP as part of the total solution

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
PBC-PSP SUMMARY provides a unique ability to connect all elements of the project organization early in the project's life and to set the tone for project operations. By writing out the Project Surveillance Plan, obtaining the coordinating signatures, and putting together the organization (coupled with "real" resources), the Project Manager has an enforceable position. Individual or collective ignorance of specific tasking, required personal responsibility, or management response to various pre-specified non-conformance situations is forestalled by prior publication of a project-wide plan.	**Slide #10-3 (concluded)**
STRATEGY SUMMARY Strategy formation is at the heart of all other performance surveillance aspects. It depends on an immense number of variables, but most of all it is an expansion of the belief of how contractor performance monitoring should be conducted. It is in the strategy that the team matches resources to a general scope of activity and identifies what is important. Several important strategies were explored. Risk-reduction strategies focus on keeping the known problems at bay by a deliberate management approach to either reduce the risk or mitigate its effect. An insight-surveillance strategy acknowledges that not everything is important all at once and that by monitoring some things, NASA management can obtain sufficient assurance that the contractor will deliver. Although neither are specifically PBC approaches, their inclusion in the strategy section provides evidence that the Agency is serious about revising the way it does business with its contractors. The strategy becomes the foundation for developing activities and establishing metrics and is the rationale for specific organizational elements participating in the project.	**Slide #10-4**

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STRATEGY SUMMARY At the lowest level, the strategy should discuss how the team will mobilize its resources to accomplish the tasks ahead of it. The management team embeds its basic philosophy in the level of centralization and staff level autonomy that will be employed within the project team. By announcing that the surveillance team will use a matrixed approach of *X, Y, and Z* elements with a central approving authority in the strategy section, the development of the organization section becomes much easier. Strategy states what will be accomplished; the other sections will go on describe the details of how it will be achieved.	**Slide #10-4 (concluded)**
ACTIVITIES SUMMARY Too often, habit takes over for sense. In defining the necessary surveillance activities, functional bias and past practices must be scrutinized to determine if the activity truly adds value. If in the past NASA performed a 100 percent inspection of green widgets and had a 100 percent acceptance rate, then it appears that the inspection may be superfluous in adding value. When defining surveillance activities, assure that team members are performing in the correct roles. The contractor is responsible for product performance, for efficiency in execution of the contract, for coordinating among the players internally, and for maintaining control of the project execution. NASA, on the other hand, must assure that the contractor will be able to deliver as requested.	**Slide #10-5**

INSTRUCTOR NOTES	**TRAINING MATERIALS AND SUGGESTIONS**
ACTIVITIES SUMMARY Three basic types of activity were identified: communication, assurance, and verification. Communication is staying in touch with the contractor organization and building the trust relationship necessary to prosecute a "no-surprises" project. Assurance activities provide "warm-fuzzies" that the design, processes, and procedures are right and that, if followed, they should result in the desired product. Verification activities provide the insight that the outcome actually meets the requirements of the SOW/SOO. Activities are the heart of defining the PBC approach. They must be at once insightful yet at the same time unobtrusive; they must meet statutory requirements while adhering to common sense precepts; they must conserve resources while maintaining Agency presence. They must always add value throughout the project life cycle. Activities define what is done. The organization section will marry these activities with people and organizations.	Slide #10-5 (concluded)
METRICS SUMMARY Metrics reflect the outcomes of processes and provide insight into the attainment of performance objectives. A combination of measures that represents absolute attainment, relative attainment, and/or process efficiency can be effective in monitoring past performance, but can also predict future performance. The project team should avoid recreating metrics already being used by the contractor. Since NASA has the ability to gather similar information from multiple sources, contrasting specific project data with industry-wide or NASA-wide data can often establish a sense of relative contractor performance in addition to establishing how well the contractor is doing in absolute terms.	Slide #10-6

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METRICS SUMMARY
 	
    By establishing initial control limits, much of the management guesswork is avoided in determining what constitutes "good" performance. Similarly, by defining management response to non-conformance, the organization begins with a unified position that can be refined with experience. Since data collection and analysis have a cost, identification of source, frequency of collection, and processing required can be used to determine if the value is worth the insight produced. It is wise to constrain the data collection and processing (recalling the Pareto principle) and rather concentrate on key information that relates to evidence of risk abatement and mitigation success.
 	
    When data are displayed, use of clear and unambiguous, storytelling presentations is preferred. If a trend is present, illustrate it and bring attention to it. If there is a problem, do not hide it by reversing scales or trivializing it. Avoid flashy graphics unless they tell the story more effectively. Never leave a doubt about what was shown when using graphic displays of metric performance.
	Slide #10-6

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ORGANIZATION SUMMARY The preferred approach to establishing the surveillance organization is lean and flat. The core team should be bound into a sense of joint destiny with the contractor. Their performance in helping the contractor and NASA in reaching the objectives should be scrutinized as a part of the accountability for performance. Similarly, the surveillance team must be involved in sharing in the spoils along with the contractor team. Since it is frequently impractical to have one of every type of specialist on staff, establishing a network of matrixed staff functions or contracting with an outside source for critical surveillance elements can be both effective and cost efficient. However, each team member must be fully aware of individual responsibilities as higher levels of accountability for individual and team performance are demanded. Planning for and providing adequate resources as an integral part of project performance surveillance provide the backplane for a team sense of importance to the project success. With the gradual phase-in of activity-based accounting, the surveillance efforts will be charged to the project and its budget line in most cases. When real money becomes involved, surveillance team performance and contribution to performance is certain to be subject to scrutiny.	Slide #10-7
CHALLENGE The administrator has published these words for everyone to see, both inside and outside NASA. The question that is on everyone's mind is, "Can we do it?" A revolution is underway. PBC is one manifestation of it. The Project Surveillance Plan is a way to do what needs to be done. As a group, it is nearly impossible to return to the ways of the past and still meet the challenges of the near future. This past 16 hours has provided this group with the tools to implement PBC, insight-based surveillance, and focused risk-reduction approaches to mission success. Individually, each person will have to make it happen. The approach belongs to no one person or functional entity. It is a project approach to controlling destiny and providing for future needs. The challenge is clear: will each person rise to it?	Slide #10-8

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WORKSHOP CRITIQUE Instructor should display this slide without further comment. Allow the workshop sponsor to address any issues and provide further direction. Thank each individual for their attendance and participation as they leave the meeting room.	**Slide #10-9**